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# USSR Report

ECONOMIC AFFAIRS

EKO: ECONOMICS AND ORGANIZATION  
OF INDUSTRIAL PRODUCTION

No. 1, January 1984

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USSR REPORT  
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## PRINCIPLES OF DEMOCRATIC CENTRALISM COMBINED WITH INDEPENDENCE

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (IKO) in Russian No 1, Jan 84 pp 3-21

[Article by R. A. Belousov, doctor of economic sciences, professor, head of the department of control of socio-economic processes, Academy of Social Sciences under the CPSU Central Committee (Moscow): "Democratic Centralism and Economic Independence"]

[Text] For directors of enterprises the work day frequently begins with solving a difficult problem: how to provide for continuous, rhythmic work of the collective where there are constant interruptions in material and technical supply? Either there is a shortage of smelted pieces or rolled metal, or some special instruments are in short supply. In Bryansk they are waiting for Gorkiy to send clutch pins which must be delivered immediately to Moscow automotive workers. In Kolomna they are not sending prepared diesel engines to the clients because the Penza machine builders are holding up deliveries of fuel pumps ... The picture is familiar, unfortunately, to many managers.

But what is the reason for this, why is the apparently strong chain of living interdepartmental ties so frequently broken? After all, the amount of local kinds of raw materials that are extracted, processed materials that are produced and energy are sufficient for a 1.3-1.5-fold increase in the final output over what is now being produced.

Of course there are many reasons. But from among them one can single out three main ones:

the excessively high proportional expenditures of primary resources per unit of useful result;

mistakes in the plans and the limited nature of operational reserves in the key units of administration;

violations of delivery discipline because of giving priority to departmental and local interests in intereconomic ties.

If one tries to generalize these factors, the result amounts to the fact that we have still not succeeded in completely carrying out the task set by V. I. Lenin in his day: to collectivize production in reality, to organize in a new way in practice the deepest economic foundations of the lives of many tens of millions of people.<sup>1</sup>

It is precisely here that one traces those vexing difficulties and tensions which impede work and reduce the efficiency of public production. Of course the economic mechanism can and should be regulated, individual parts of it should be mended or replaced, and instruments should be improved. But one still cannot forget about its basic design, whose axis is the Leninist principle of democratic centralism. "The tested principle of the organization of all life of a socialist society," wrote Yu. V. Andropov, "is democratic centralism, which makes it possible to combine successfully the free creativity of the masses and the advantages of a unified system of scientific management, planning and administration."

V. I. Lenin, as if foreseeing the possibility of the appearance of extremes in realizing the fundamental principle of the organization of production, warned that, in the first place, democratic centralism must not be confused with a distortion of it -- bureaucratic centralism, and, in the second place, that socialist centralization envisions extensive independence, creative initiative and activity of local agencies of authority, enterprises and labor collectives.

At first glance, the very idea of a simultaneous strengthening of centralized foundations and expansion of local independence seems contradictory. Indeed, is it possible to strengthen central foundations and carry out decentralization of management in parallel in one and the same economic system? If this matter is approached mechanically, it is impossible. But the dialectical method makes it possible to find a solution to the problem. It consists in improving the quality of the work of state administrative agencies (herein lies the essence of the strengthening of centralized foundations) while simultaneously unburdening them of the duty to solve a number of operational management problems related to the fulfillment of the national economic plan, and transferring these problems to the local levels. The shifting of authority and responsibility from above to below as structural ties take on a larger scale and become more complicated is a predictable feature of the development of a system of planned management for the foreseeable future.

Centralization, which means a unified policy and practice in solving problems that involve common interests, is realized under socialism in the interests of, under the control of, and with the active participation of the masses of people. This gives it a democratic nature. Still, democratic centralism not only does not limit, but, on the contrary, relies on extensive independence and initiative of local soviets and public organizations and enterprises, which makes it possible to take fuller advantage of the social factors of economic growth and to account more flexibly for the peculiarities of the development of labor collectives and individual regions.

Even on the eve of the October Revolution, V. I. Lenin came out decidedly in favor of strengthening centralized foundations in the management of the socialist economy, relying on the fundamental position of K. Marx: "Marx is a centralist ...," he wrote. "Only people who are filled with narrow-minded 'superstitious belief' in the state can perceive the destruction of the bourgeois state machine as a destruction of centralism!"<sup>2</sup>

In the spring of 1918 'during the process of preparing his program article, "Immediate Tasks of Soviet Power," when developing these ideas V. I. Lenin emphasizes their dialectical nature: "democratic centralism ... does not preclude, but, on the contrary, presupposes the most complete freedom of various localities and even various communities of the state in the development of diverse forms of state, social and economic life."<sup>3</sup>

#### Democratic Centralism and Socialist Collectivization of Production

The process of collectivization of production is manifested in various forms. V. I. Lenin distinguished nationalization (the transfer of property to the state as a result of adopting the appropriate legal acts) and real collectivization, that is, the formation of economic relations of socialist property in reality.

With the changeover to socialism we overcame the antagonism between the public nature of production and the ownership of private property. But in the economic mechanism there remains a fairly critical contradiction between national economic and departmental and also local interests, which leads to a situation where planning relations are violated and the process of public division of labor is retarded. As a result, the effectiveness of public production decreases. This is quite clear from the example of the development of specialization and concentration of production. Calculations show, for example, that the deepening specialization of our machine building enterprises to the level of the best associations would open up the possibility of more closely and extensively combining science and modern technology with production, and would increase its useful return by 30-50 percent.

Let us recall that collectivization necessarily encompasses (although not at the same time) productive forces, economic relations and the system of management.

The initial changes are the structural ones in productive forces which are related to specialization and concentration of production. Under modern conditions, under the influence of the scientific and technical revolution, the process of specialization assumes a number of new features. There is a larger proportion of enterprises engaged in the manufacture of so-called intermediate products: billets, batching items, sets of components, spare parts. Or they perform individual technological operations: smelting, forging, welding, assembly, repair. Thus there is an increase, and a gigantic one, in the number of contacts and ties in the process of cooperation.

Thus a large machine building plant receives 3,000-5,000 various kinds of items from several hundred suppliers. Hundreds of organizations participate

directly in the construction of a hydro-electric power station, and during the course of their work they establish numerous business contacts among themselves. Each day a modern metallurgical plant sends out several trainloads of sheet metal, tin and various kinds and profiles of rolled metal. These are sent to thousands of plants and construction sites throughout the country and abroad. The overall number of cooperative deliveries to the USSR is in the many millions. This figure shows how the interdependence of individual units of the national economy has increased and how complicated it has become to control the processes of specialization and cooperation of production.

With the ramified interrelations within the economy, the level of collectivization depends largely on the quality of the unified national economic plan. The importance of the plan in reaching agreement and coordinating an ever greater number of factories working for one another is constantly increasing. Even a couple of decades ago, in cases where the cooperating factories did not deliver some part on time, the client factory could manufacture it itself, although perhaps at great expense. Now batching items and sets of equipment have become so complicated and the requirements for quality have increased so much that the client plant is frequently not capable of producing them. This would require special equipment, special materials and trained personnel. In practice life is forcing more and more plants to manufacture for themselves in a primitive way small series of items which are in short supply. But the large outlays and the poor quality of these items only confirm the unfeasibility of solutions of this kind.

The deeper the division of labor, the greater the degree of mutual augmentation of the participants in public production and the greater the demand for organizational and economic support for the integrity of the entire economic system of socialism. The basis of this integrity, its bearing structure, is public ownership of the means of production.

The process of collectivization is taking place fairly intensively under capitalism as well, especially within the framework of modern monopolies and international corporations. Nonetheless the capitalist concept of property is too narrow for the scale of collectivization of productive forces which is dictated by the scientific and technical revolution. Describing the basic economic contradiction of capitalism, V. I. Lenin wrote: "Is it really not clear that form of production enters into an irreconcilable contradiction with the form of appropriation? Is it really not obvious that the latter cannot be adapted to the former, that it cannot but become social as well, that is, socialist?"<sup>4</sup> Here V. I. Lenin had in mind not a simple quantitative expansion of the scale of ownership, but deep structural changes in the entire totality of production and management relations. "Collectivization of labor, which has been carried out by the factory on an immense scale, and the transformation of the feelings and understandings of the population it employs (particularly the destruction of the patriarchal and petit bourgeois traditions) evoke reaction: large machine industry, as distinct from preceding stages, insistently requires planned regulation of production and public control of it."<sup>5</sup> Socialist property opens up the possibility of such regulation and public control with the help of a unified national economic plan and a state budget.



"Socialism," said Lenin, "is the construction of a centralized economy, management from the center."<sup>6</sup>

On the basis of socialist property, planning relations develop, which reflect a new quality of the interrelations among participants in collective production -- the high level and persistent nature of the deliberate coordination of their actions both on the scale of the enterprise, branch and region, and on the scale of the national economy as a whole. This quality is especially important because of the fact that collectivization of production entails consequences of a dual nature. On the one hand it acts as a social and organizational form of scientific and technical progress and increased effectiveness, and on the other -- as a factor which sharply increases the number of cooperative ties and makes these ties more complicated.

V. I. Lenin not only saw this contradiction clearly, but he also found the main way of surmounting it: the development and strengthening of democratic centralism which makes it possible to coordinate the development of specialized teams and to limit the effects of random, as a rule, destabilizing factors. Centralization, in turn, acts as the main method of implementing planning. Even in the first years of Soviet power V. I. Lenin wrote: "All the plans of individual branches of production should be strictly coordinated and linked, and together they should comprise that unified economic plan which we need so much."<sup>7</sup>

The present stage of socialist construction is characterized by a higher level of maturity of democratic centralism in management of the economy. But the level of coordination and balance of many cooperative ties still lag behind the requirements for the development of modern productive forces. In order to overcome this lag, it is first of all necessary to raise planned management to a qualitatively higher level. It was therefore quite predictable that the November (1982) and June (1983) Plenums of the CPSU Central Committee demanded that work be accelerated for improving the entire sphere of management of the economy, administration, planning and the economic mechanism. "To provide for well arranged, continuous work of the entire economic mechanism," emphasized Yu. V. Andropov in his speech at the June (1983) Plenum of the CPSU Central Committee, "this is a requirement of the present day and a program task for the future. This is a constituent part of the entire process of improving our social structure." In keeping with this the CPSU Central Committee and the USSR Council of Ministers adopted a decision to conduct an economic experiment in expanding the rights of production associations (enterprises) in planning and economic activity and increasing their responsibility for the results of their work.

#### Paths to Further Improvement of Planned Administration

From Lenin's point that democratic centralism does not preclude, but, on the contrary, presupposes extensive freedom of local economic activity it follows that the economic system of socialism can be more effectively controlled and regulated with the help of two interconnected but still relatively independent subsystems: central and peripheral. In practice this is manifested in the active participation of the labor collectives in solving statewide, branch and

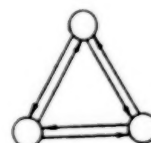
regional problems, in their extensive independence when fulfilling planned assignments and also solving problems related to the development of the collective and individual workers, and in their accounting for local conditions and peculiarities. "Not to take local differences into account in all these issues," wrote V. I. Lenin, "... would hamper local workers in accounting for local differences, which is the basis of reasonable work."<sup>8</sup>

Each of the subsystems performs its functions. Attempts to duplicate or combine these functions lead to an overloading of one system and a weakening of the other, which has a negative effect on the quality and effectiveness of the entire economic mechanism.

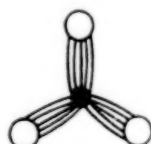
The art of administration consists in optimally delimiting and at the same time combining the economic and organizational functions of both subsystems. The different ways of solving this problem can be illustrated by the following simplified diagram.



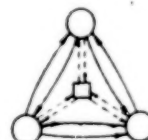
1. Relations between two independent enterprises



2. Relations among three independent enterprises



3. Relations among three enterprises through a central agency



4. Relations among three enterprises with the participation of a central agency

As one can see from the figures, intereconomic ties between two independent enterprises are relatively simple and quite controllable without a central agency. When a large number of enterprises are cooperating the number of mutual deliveries increases sharply. Diverse variants of them are also possible. The search for and adoption of an optimal decision can take place randomly, through the market, or deliberately, with the help of a unified central agency. But is it possible to direct, regulate and control all interrelations centrally? Extreme circumstances and limited resources, for example, during a period of accelerated industrialization in the country or a military situation can make it necessary to turn to that model. But with an increase in the number of these ties the overload on the central staff will be reflected in the degree of substantiation of decisions and plans that are made, which, in turn, is accompanied by no small losses because of interruptions in the supply of the enterprises with materials, energy and transportation.

Only three enterprises were used in the diagram presented above for illustration. But what if there were 10,000 of them and the economic ties number in the millions? Would a central administrative agency be able to encompass and regulate them, even with the help of the most highly productive electronic equipment?

Practice shows that it could not. Attempts to grasp the ungraspable, to centrally encompass and regulate the majority of intereconomic ties for distribution of the products of material production constitute one of the reasons why the level of coordination of many plans is not high and there are interruptions in material and technical supply. It is apparently necessary to search for and establish something different from the present relationship in the interactions between the central and peripheral systems in administration of the economy. The general tendency consists in sequentially relieving the staff of central agencies from solving those problems which can be transferred to the competence of associations, enterprises and also local soviets. This pertains primarily to intereconomic ties and local coordination of the activity of various departments. "The lack of coordination of the work of various departments locally," wrote V. I. Lenin, "is one of the great evils which impede economic construction ... The task of economic councils is to eliminate this<sup>9</sup> lack of coordination and develop the independence of local institutions."

The USSR extracts and produces enough metal, plastic, cement, mineral fertilizers, timber, construction materials, petroleum, gas and coal for continuous satisfaction of the needs of the national economy and the population. But this requires a different system for regulating the exchange of products and also economical, responsible expenditure of resources.

V. I. Lenin related directly the degree of local independence and the scale of production of the necessary resources. "When there was an urgent need for food, for example," he wrote, "it was natural and inevitable to have the greatest limitation of local independence in the consumption of the grain that had been harvested. With the proper control and as the supplies of grain increased, it was necessary to increase this independence. This way one can and should reduce the amount of bureaucratism, reduce shipments and incentives for production, and improve the position of the peasants and workers."<sup>10</sup> Additionally, Lenin was always in favor of strengthening the centralized foundation: "In general enterprises cannot function correctly without a unity of will which joins all workers into one economic organ, working with the correctness of a clock mechanism."<sup>11</sup>

These words sound extremely timely even today. Relieving the national economic planning and supply agencies of concerns about the distribution of a largely artificially created deficit of certain kinds of products certainly does not mean weakening the centralized foundation in administration.

Such a unity of will (in close combination with science) is extremely necessary when solving all national economic problems, in the majority of cases, structural, interbranch and interregional problems:

the unified social policy, including in the area of prices and incomes, which presupposes state control over price setting and centralization of public consumption funds;

the active technical and structural policy, which provides for widespread and rapid realization of the achievements of science and technology in production;

the investment policy, which is directed toward maintaining the necessary proportionality and progressive structural changes in the fixed capital of the national economy.

A centralized solution to these problems presupposes concentration of a significant part of the accumulation fund in the state budget and the corresponding banks.

As for the peripheral system of administration and regulation, its role will also increase steadily. Even in the "Orders from the STO (Council on Labor and Defense) to Local Soviet Institutions" V. I. Lenin emphasized especially: "The duties of the provincial ispolkoms include some kind of preliminary establishment of rules most suitable for the given area with mandatory expansion and not narrowing of 'local' initiative and independence in general, and that of the lower units in particular."<sup>12</sup> The role of local soviets increased significantly after the adoption of the USSR Constitution and the law concerning the basic authority of kray and oblast soviets of people's deputies and soviets of people's deputies of autonomous oblasts and autonomous okrugs. The majority of measures contained in the decree of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers of 19 March 1981, "On Further Increasing the Role of the Soviets of People's Deputies in Economic Construction," are devoted to one of the most important functions of local soviets -- ensuring comprehensive economic and social development of the corresponding territory. Along with their coordinating functions in the development of individual branches in the given rayon, local soviets are beginning to deal more and more actively with problems of forming and utilizing the production and social infrastructure, training labor resources and utilizing them better, providing for the life, recreation and medical service for the population, and protecting the environment.

#### The New Role of Modern Associations

Experience has shown that branch ministries do not perform well or completely enough one of their main functions: the development and implementation of a unified technical policy for the branch. The assortment of items produced within the framework of the branch is too large. Apparently, in the future the development and implementation of such a policy, coordinated with a determination of the final products to be produced and the corresponding technology, will be shifted to associations, although not in their present form, but to a new type of association.

Taking into account the experience of Soviet scientific production associations and the combines of the GDR, it seems expedient to create in the



key areas of Soviet industry approximately 500-600 large production associations with new functions, duties and capabilities. Such associations should be made responsible for complete satisfaction of the needs of the national economy or individual regions for the kinds of products in which they specialize, and also for the effectiveness of their production, repair and operation.

In order for the associations to perform these functions successfully, in addition to 10-20 interrelated enterprises that form a relatively closed cycle of labor cooperation, they should include large scientific research subdivisions, planning and design organizations, and also one or two experimental plants. Practice has shown that many branch scientific research institutes, approximately half of which do not have their own production base, have not produced good results and are not in a position to meet the world standard of quality in their developments. In associations that produce complicated machinery or technical systems it would also be expedient to create specialized subdivisions that handle their assembly, technical servicing and repair.

The new type of association would combine in practice the achievements of modern science and technology with mass production, and they would provide for:

raising the quality of the products that are produced to the level of the best world standards;

developing and introducing highly productive and at the same time energy- and material-saving technologies;

streamlining labor and production processes, and renovating and modernizing special equipment;

reducing the cost of operating and repairing the machines, instruments, household appliances and other complicated items that are produced.

Such associations are capable of solving independently a fairly broad range of technical, production and social problems. This presupposes essential changes in the planning, financing and material incentives for associations and enterprises.

The planning of large structural changes in the national economy and in the country's social development will remain at the nationwide, state level. A necessary means for their practical implementation is a monetary, investment and credit policy, and also a system of planned price setting. If the new type of association is made responsible for satisfying the needs of the population and the national economy for specific kinds of products, there will not longer be a need to give them assignments regarding production volume and assortment. Such a solution would correspond to Lenin's instruction concerning the need to encourage "the greatest initiative, independence and scale of work in local areas."<sup>13</sup>

In our opinion, the main directive and fund-forming indicators assigned to the associations could be consolidated normatives of the effectiveness of production, which characterize the useful final results and the volume of expended resources. In this case the association's production program and, consequently, the volume and assortment of the products would be determined on the basis of agreements concluded by the association management itself. It will also be necessary to improve the system of distribution of orders and evaluation of the fulfillment of agreements. In particular, the unaccepted orders from other enterprises and organizations, which show a failure to satisfy public demand, should be made tantamount to a failure to fulfill agreements and should be taken into account in the summary evaluation of the results of the association's work.

In this connection let us turn to the principles developed by V. I. Lenin when he was executing the large economic maneuver known as the changeover to the NEP. One of the main peculiarities of this maneuver was that in 1921-1922 the enterprises were combined into trusts working under rigid conditions of commercial accounting, that is, according to the principle of self-repayment. The VSNKh [All-Russian Council of the National Economy], which at that time was performing the functions of the people's commissariat of industry, gave no assignments concerning the assortment and volume of products to be produced, and provided no material supplies. The trusts received raw materials, processed materials, fuel and equipment, and they sold the final products through specialized supply and sales associations (subsequently, syndicates), which operated on a commercial basis.

The annual rates of growth of industrial production were very high -- 25-30 percent. There was a good deal of strain in the economy at that time, but there were no appreciable interruptions in supply. A decisive role here was played by the high responsibility of the collectives and the economic managers for observance of contractual discipline, and the profitability of operation, which means also economical operation. The extremely great demands for final results of the activity of the trusts with very broad economic independence is shown by the note from V. I. Lenin to the people's commissariat of finance: "You told me that certain of our trusts can end up without money in the near future ... I think that the trusts and enterprises were founded on principles of autonomous financing precisely so that they themselves would be responsible, and completely responsible, of the profitability of their enterprises. If they have not achieved this, in my opinion, they should be taken to court and sentenced along with all members of the board to a long prison term (perhaps to be released on parole after a certain period of time), confiscation of all property, and so forth."<sup>14</sup>

Of course it would be a mistake to mechanically transfer the economic practice of the beginning and middle of the 1920's to modern conditions. But the main idea -- close and balanced combination of the independence and responsibility of the enterprises -- remains timely even today.

A most important step toward such administration is to grant greater freedom in the formation of the structure of economic ties. Attention should be given to the experience of recent years in concluding delivery agreements among

enterprises. Relatively recently the agreements served only as an auxiliary means of concretizing and refining assignments for central planning and it was as though they were in the shadow of the larger management concerns. The situation in this area changed under the 11th Five-Year Plan: the fulfillment of deliveries under contracts became a mandatory condition for material incentives for management personnel and the collectives of the enterprises.

But new problems arose immediately. In the first place, large suppliers try to avoid concluding agreements with "small" clients. In the second place, this question arose: how does one coordinate the agreement and the production program of the plan?

The practice is extremely varied. Thus the Moscow Kompressor plant, for example, first submits an order for material and technical supplies and develops a production program (plan), and then it concludes agreements which, as a rule, are not coordinated either with the program or with the orders for materials and batching items. The textile machine building plant (Klintsy), conversely, first concludes agreements and submits orders for materials, and then receives "from above" the adjusted production program, which again, as a rule, diverges from the agreements that have been concluded.

Apparently it is necessary to leave one thing as the main instrument for direction and evaluation: either the agreements or the production program. In order to improve the quality of work of the central planning agencies, it is important to relieve them of "running idle" since the production program they establish is frequently adjusted several times a year. In our opinion it would be expedient to grant the new type of association the right to establish for itself the volume and structure of production, taking into account the orders that have been submitted and the agreements that have been concluded.

#### Worker Participation in Management of the Economy

When speaking of the development of socialist democratism directly in the sphere of production, one should recall the content with which V. I. Lenin invested this concept. It is necessary to reach a situation, he wrote, where "the conscientious worker not only feels that he is the master in his plant, but also a representative of the country, where he feels his responsibility."<sup>15</sup> More than six decades have passed since the time when these words were uttered. And today it is no longer enough for the worker just to feel that he is the master in production, -- it is important for him to act correspondingly, and not to put up with cases of extravagance or losses, not to mention theft of public property.

In all branches of the national economy one can find many examples of workers or kolkhoz workers who are worried about the common cause and act as property owners -- representatives of the state in production. But, unfortunately, it has not become the general rule to have a responsible and enterprising attitude toward the quality of work and the utilization of working time and material resources. For example, one can frequently see how prepared products lie out in the open for days and even weeks until they are no longer suitable for use. Labor dies. Or there is this picture. The worker has gone to

dinner and has forgotten to turn off the engine of a machine tool or bulldozer. Tractors and combines frequently spend the winter unlubricated and uncovered, and fertilizers lie spoiling where they are dumped. On the fields there are haystacks with holes in the middle where water seeps in and they hay rots. But the most alarming thing is that there are people who are supposed to be the owners of all this wealth who do not seem to notice anything. Sometimes they talk among themselves and refer to the lack of order, forgetting that they themselves are the masters here and that what is needed here is action rather than talk. After all, when a fire breaks out nobody stands to the side. But here in production when, because of inefficiency, slovenliness or someone's personal gain, public property disappears or is pilfered, it is even more necessary for each of us to take an active civic position.

Why do all public property owners not take such an active position, and why do they overlook blatant cases of inefficiency? One should not come to hasty conclusions. They are not so simple. For in order to fight inefficiency -- and this is one of the major forms of worker participation in management -- it is frequently necessary not only to disclose, but also to surmount critical contradictions. Therefore participation in management frequently leads to sharp conflicts with the violators of order, discipline and the normal work rhythm, and to a fight against people who abuse their job positions or take a negligent attitude toward their work. All this requires the expenditure of effort, nerves and time.

The USSR Law on labor collectives establishes: "Conscientious discipline and high organization in the work of labor collectives, initiative and activity, and mass technical creativity of the members of collectives are indispensable conditions for intensification of production, acceleration of scientific and technical progress, increased productivity of public labor, improved well-being of the Soviet people, and all-around development of the individual." As experience shows, these possibilities are realized only with certain economic and ideological prerequisites, when the mechanism of economic motivation of the workers for the final results is in effect, motivating them to display initiative and participate actively in the management of production. And the most important of these prerequisites is increased material and moral responsibility of the workers for the final results of their economic activity.

Under socialism, as we know, production is carried out in the interests of the society and through the society. But it should be recalled, that the socialist form of assimilation of material goods means not only centralization of most of the national income, but also the fact that most of the losses of various kinds are covered at the expense of the society. But the society is the workers: all of them together and each of them individually. This is why inefficiency means a direct deduction from the public consumption fund. Therefore it cannot be tolerated, regardless of where it may appear.

The participation of the masses in the management of production presupposes a respectful attitude not only toward the collective, but also toward each individual. A businesslike and rapid response from the plant administration



or the kolkhoz board to a critical remark from a rank-and-file worker, the managers' ability to see a grain of truth in each remark and rectify the situation promptly -- all this creates a good moral atmosphere and helps to increase the activity of the people, for they see their opinions being heard and their initiative bearing fruit.

Now, as was noted at the June (1983) Plenum of the CPSU Central Committee, it is important to increase the effectiveness of all forms of socialist democracy in production. "We must," said Comrade Yu. V. Andropov, "declare a real war against the practice whereby our democratic norms and positions are not supported by actions, whereby one is satisfied merely with the form, with the appearance of action." One should clearly understand that the success of the labor collectives and the dynamism and effectiveness of the development of the entire national economy now depend largely on how effective the forms of manifestation of social activity are now.

#### FOOTNOTES

1. See Lenin, V. I., "Poln. sobr. soch." [Collected Works], Vol 36, p 171.
2. Ibid., Vol 33, p 53.
3. Ibid., Vol 36, pp 151-152.
4. Ibid., Vol 1, p 178.
5. Ibid., Vol 3, p 545.
6. Ibid., Vol 37, p 422.
7. Ibid., Vol 42, p 154.
8. Ibid., Vol 45, p 198.
9. Ibid., Vol 43, p 278.
10. Ibid., Vol 43, p 278.
11. Ibid., Vol 36, p 157.
12. Ibid., Vol 43, p 273.
13. Ibid., Vol 43, p 271.
14. Ibid., Vol 54, p 150.
15. Ibid., Vol 36, pp 369-370.

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## LABOR RESOURCES REGARDED AS FACTOR IN PRODUCTION INTENSIFICATION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 22-38

[Article by L. A. Kostin, professor, doctor of economic sciences, first deputy chairman of the USSR State Committee for Labor and Social Problems (Moscow): "Reserves for Utilization of Labor Resources"]

[Text] Under modern conditions intensification of public production is a strategic direction in the development of the economy. In the 1980's the need for this is dictated, along with other factors, by the aggravation of the demographic situation. Therefore the 26th CPSU Congress and the November (1982) and June (1983) Plenums of the CPSU Central Committee set as one of the main tasks -- to increase the effectiveness of the utilization of labor resources. "... A key task is a radical increase in labor productivity," said Yu. V. Andropov in his speech at the July (1983) Plenum. "We must strive to reach the world level in this sphere."

As we know, there are also two directions in the utilization of labor resources: intensive, which is related to a reduction of the expenditures of live labor per unit of output, and extensive, which involves employing those who are not yet employed in public production, and also a reduction of labor losses caused by labor turnover, improvement of working conditions, and so forth.

Let us consider each direction.

### Increased Labor Productivity -- A Decisive Factor

A decisive role in increasing the effectiveness of the utilization of labor resources is played by intensive factors, which are reflected in increased labor productivity.

At the November (1982) Plenum of the CPSU Central Committee it was noted that labor productivity is increasing at rates which we cannot find satisfactory. During the 10th and the beginning of the 11th Five-Year Plan the growth of labor productivity in industry decreased. This tendency was manifested fairly strongly and was reflected in the rates of development of the entire national

economy. Moreover the level of labor productivity in industry remains lower than in a number of economically developed capitalist countries. All this is determined by many factors, both objective and subjective, the most important of which are:

reduction of the growth rates of capital investments;

shifting of the raw material branches to the northeastern regions of the country, where labor expenditures and capital investments in the assimilation of new deposits are higher, and also the bringing poorer and smaller deposits into economic circulation;

a large proportion of labor-intensive and capital-intensive raw material branches of industry and a relatively smaller proportion of branches of group "B";

obsolescence of fixed production capital as a result of their slow updating and an inadequate proportion of capital investments used for renovation of existing enterprises;

arrears in the development of the infrastructure: material and technical supply, warehousing, and especially transportation;

inadequately effective utilization of socio-economic factors in development (planning, administration, stimulation, strengthening of state, production and labor discipline, and so forth).

Overcoming the factors that reduce the growth rates of labor productivity and skillful utilization of the main factors in its growth (technical progress, skills of personnel, strengthening discipline, improvement of labor organization) should lead to an acceleration of its growth rates.

#### Acceleration of the Mechanization of Manual Labor -- An Immediate Task

The intensive path of the utilization of labor resources is related primarily to scientific and technical progress and above all to acceleration of the mechanization of labor. At the beginning of the current five-year plan the number of workers engaged in manual labor in our national economy amounted to 40 million. In industry during the past 10 years (1972-1982) the proportion of those involved in manual labor only decreased from 35.4 percent to 30.2 percent. In the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 concerning improvement of the economic mechanism it was pointed out that one of the primary comprehensive programs should be the program for reducing manual labor.

What is the situation with respect to solving these problems at the present time? Assignments for reducing manual labor have been set for 35 industrial ministries, but in terms of quantity for the 11th Five-Year Plan they have been earmarked in minimal amounts. During the 5 years it is intended to release 1.2 million people as a result of mechanization of labor. Even now it is becoming clear that the earmarked scale is inadequate. During the course

of the fulfillment of the current five-year plan it is necessary to achieve a greater reduction of manual labor, for otherwise it will be very difficult to provide new enterprises with labor force. But the critical nature of the problem is still not fully recognized. This is shown by the fact that during the first 2 years of the five-year plan a number of branches did not achieve even this minimal indicator, including the ministries of the coal industry, ferrous metallurgy, heavy machine building, nonferrous metallurgy and several others.

The development of a special-purpose comprehensive program for mechanization of manual labor is being carried out with great deviations from the earmarked time periods. Although it is one of the primary ones, this national economic program is being developed only for the 12th Five-Year Plan and subsequent years.

Regional programs for reducing manual labor were drawn up promptly in many republics, oblasts and krais, but they were not coordinated with the central departments and ministries.

At the present time the USSR Gosplan, the State Committee for Science and Technology, the State Committee for Labor and Social Problems and the AUCCTU, with the participation of other ministries and departments have developed on instructions from the government and established as part of the special-purpose program a program for mechanization of loading and unloading and warehouse work for the years that remain in the 11th Five-Year Plan and the subsequent period. But so far the machine building ministries are not completely fulfilling the assignments for producing equipment for mechanizing these jobs.

#### The Labor-Saving Nature of Technical Equipment -- A Most Important Criterion

The foundations for future effective utilization of labor resources are laid in the stage of the design and creation of new models of technical equipment and technology. Therefore it is very important for the labor-saving nature of machines and mechanisms and the enrichment of the content of labor when they are used to be among the most important criteria for evaluating new technical equipment and the work of its creators.

Unfortunately, in recent years the effectiveness of new technical equipment has not only not increased, but has even decreased in this area. Thus while in 1970 for every 1 million rubles spent on measures for new technical equipment there was a conventional release of 80 people, in 1980 this figure was only 57.

Therefore the task of radically increasing the effectiveness of newly created machines and equipment is very important. Their productivity should increase 1.5-2-fold. The task is very complicated, but without it it is impossible to solve the problem of sharply reducing labor expenditures and economizing on labor resources. It is necessary to utilize all the advantages of the scientific and technical revolution, especially in the last stage, which promises a technological revolution in many spheres of production. This is



the way the issue was raised at the June (1983) Plenum of the CPSU Central Committee.

Closely related to these problems is the problem of renovation. Under the 11th Five-Year Plan, unfortunately, we did not manage to significantly increase capital investments in renovation of existing enterprises. The proportion of capital investments for these purposes increased from 29 percent under the past five-year plan to 32 percent under the current one. In the GDR, for example, expenditures on renovation amount to 60 percent of the capital investments. Of course this situation cannot be completely analogous, if only because of the different branch structures: we have, as we know, a large number of raw material branches which constantly require more capital investments in new enterprises. But apparently the proportion of capital investments in renovation of existing production should be increasing at more rapid rates.

It is useful to give data about the aging of existing fixed capital. In the 1970's the replacement of the active part of fixed production capital which had been removed amounted to only 2.3-2.5 percent per year, which is quite inadequate for modern conditions. Or another example: in 1981 only 24 percent of the new metal processing equipment went to replace old equipment at existing enterprises, and all the rest of it went for enterprises which were being put into operation for the first time. Therefore, with a large growth of fixed production capital, the national economy is being burdened with old equipment, and this, of course, impedes the growth of labor productivity and the savings on labor expenditures.

Naturally, old equipment requires immense labor expenditures for repair. Thus at the beginning of the current five-year plan 3.9 million people were employed in the repair of equipment, and only 400,000 people were engaged in this at specialized enterprises, which also shows the low level of specialization of this work.

#### Let Us Turn to the Organizational Reserves

Along with scientific and technical progress, improvement of labor organization plays an important role in economizing on labor resources. In particular, the brigade and other collective forms of labor organization are very important.

In keeping with the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, brigade methods of labor should become the main ones under the 11th Five-Year Plan. The State Committee for Labor and Social Problems has developed a number of methodological guidelines concerning the brigade form of labor organization. But in recent years the development of brigade forms has proceeded mainly in breadth. During the past 2 years the number of workers in brigades has increased from 10.8 million to 15.4 million people. In industry 60 percent of all the workers are employed in brigades. But many brigades are small. Almost two-thirds of them consist of 10 people, which impedes the organization of mutual assistance and combination of jobs. There has been no profound improvement in the organization and stimulation of

labor in brigades. Thus the proportion of people in brigades with payment according to the final results amounts to only half of all those who are working in brigades. Only in the Ministry of Power Machine Building and the Ministry of Power and Electrification has the overall productivity of labor in brigades recently increased more than the average for the branch. And in a number of other ministries the growth of labor productivity in the brigades has been at approximately the same level as the overall growth of labor productivity in the branch.

Unfortunately, very few autonomously financed brigades have been created. Their proportion in the overall number of brigades throughout the country is increasing slowly. Approximately one-eighth of the workers are employed in autonomously financed brigades. In a number of ministries, particularly in the Ministry of the Chemical Industry, the proportion of autonomously financed collectives does not exceed 1-2 percent of all the brigades. We can find a number of reasons here, but the main one is the lack of a normative base for the development of autonomously financed brigades.

Further development of brigade organization and payment for labor consists in the creation of comprehensive and all-around brigades working under a single contract with payment according to the final results and distribution of earnings with the help of the coefficient of labor participation.

In addition to this, it would be desirable to extend the brigade form to larger structural subdivisions. The experience in the construction of the Urengoy-Pomary-Uzhgorod pipeline, the Sibkomplektmontazh association and other industrial enterprises shows that great effectiveness of this form, which closely combines mutual motivation of basic and auxiliary workers and engineering and technical personnel. The great economic and social effectiveness of the brigade contract is achieved as a result of extensive combination of jobs, increased overall interest in the final results, increased skills and the mastery of advanced labor methods and devices, increased control on the part of workers over the contribution of each to the collective results, strengthening of discipline, reduction of labor turnover, and the inculcation of a sense of collectivism and comradely mutual assistance.

One of the leading areas for increasing the effectiveness of brigade organization of labor is combining occupations and jobs, and releasing workers on the basis of this. But so far only 5 percent of the workers in industry combine occupations and functions, even though there are great possibilities of doing this here. Realizing them will require significant efforts for training and retraining personnel and taking advantage of all possibilities of stimulating and organizing this work.

An important factor in improving the utilization of labor resources is increasing the coefficient of shift work and utilization of equipment. The coefficient of shift work in machine building, this most important branch of our economy, as we know, remains low, and it has been dropping in recent years. At the present time the coefficient of shift work in machine building, if one includes all equipment, does not exceed 1.3.

Without increasing the number of personnel (we have no possibility of increasing the number of personnel employed on machine tool equipment), it would seem, it will be very difficult to solve the problem of increasing shift work. Nonetheless this problem can and should be solved. By what means? First of all as a result of combining occupations and jobs, developing the practice of operating more than one machine tool, and, finally, through removing less productive equipment from the shops and utilizing highly productive machines better.

In recent years such work has been underway at enterprises of Leningrad. We should examine this experience very attentively and, acting very cautiously, take advantage of it.

An essential reserve for increasing labor productivity is further strengthening of labor discipline. Concrete measures in this area, in keeping with the requirements of the decrees recently adopted by the CPSU Central Committee, the USSR Council of Ministers and the AUCCTU will undoubtedly contribute to increasing labor productivity and improving the quality of the work.

#### Taking Advantage of All Possibilities

In the 1970's the USSR reached a high level of employment of the population in the sphere of public labor. The previously existing possibilities of augmenting the labor force of the national economy are becoming increasingly limited. The growth of the number of workers and employees decreased from 24 percent in 1961-1965 to 10 percent in 1976-1980. During the years of the 11th Five-Year Plan it will decrease even more. This is determined by a number of factors, primarily the smaller growth of the number of able-bodied population because of the overall reduction of the birth rate and the increased contingent of people reaching pension age. In 1980 as compared to 1960 the natural growth of the population in the country decreased from 17.8 to 8 people per 1,000, that is, to less than one-half, and in 1982 it was 8.9 people per thousand.

During the current decade there will be an increase in the number of population who have passed working age, since the people going on pension will be men and women who were born in the second half of the 1920's when the birth rate in the country was high and the death rate (especially of children) decreased sharply. Moreover, until recently the men reaching pension age were those who participated in the Great Patriotic War. Because of the military losses there were considerably fewer of them than there will be in the future. In the 1980's it is presumed that the number of pensioners will increase by almost 4 million people as compared to the past decade.

As a result, the growth of the working-aged population in forthcoming years will decrease considerably as compared to the last decade. This reduction began even at the beginning of the 11th Five-Year Plan. In 1981 the growth of the working-aged was less than at the beginning of the 10th Five Year Plan, and in 1985 it will be even less. The problem is complicated even more by the fact that the growth of the population is not uniform in various regions of

the country. As we know, the greatest growth is taking place in Azerbaijan and Central Asia, while it is decreasing sharply in the RSFSR, the Baltic republics and other regions.

The difficulties in providing enterprises with labor force are reflected in the balance of labor resources itself. Under the 11th Five-Year Plan the increase in the number of workers and employees should be considerably greater than the increase in the number of population of working age. How can this be? In the first place, as a result of increasing the employment of people of pension age. In recent years much has been done to motivate them to continue to work in the public economy. As a result, approximately two-thirds of the workers who have reached pension age are continuing to work. But it is necessary to take a number of measures for more expedient utilization of this part of the country's labor resources.

In the second place, as a result of people employed at home and in private subsidiary farming. But one must keep in mind that the introduction under the current five-year plan of partially paid vacations for working mothers to care for their children until they reach the age of 1 year and additional unpaid vacation until they are a year and a half will apparently increase the outflow of women from production into housework.

And enlisting for work in public production those who are employed in housework and private subsidiary farming is one of the sources for augmenting labor resources. This pertains to all regions of the country, but especially Central Asia and Azerbaijan. In these republics women are extensively drawn into housework, especially in rural areas. The task here is to utilize labor more fully.

Each year hundreds of thousands of boys and girls enter the ranks of the working class, the kolkhoz peasantry and the intelligentsia immediately after completing secondary school. Their preparation for labor activity, their distribution and utilization, and their adaptation to labor are of immense economic and social significance. Unfortunately, there are essential shortcomings in this work. Now more than 40 percent of the youth who have completed school enter production without an occupation or a more or less clear idea about their future work since the secondary general educational school still continues to prepare youth not so much for labor activity as for entry into VUZes. A question about the shortcomings in the system of public education was raised quite pointedly at the June (1983) Plenum of the CPSU Central Committee. A certain number of the youth who do not enter VUZes do not enter into public production, but continue to try to pass the entrance examinations. The schools must change more decisively in the direction of preparing youth for labor, for a well-founded selection of an occupation.

Of the extensive factors in improving the utilization of labor resources, increasing the working time of employees until it reaches the optimal duration is also of essential significance. This pertains primarily to workers in agricultural and certain other seasonal jobs (working in peat bogs, fishing during the fishing season, and so forth).



There are also large losses of labor because of the unjustified practice which is becoming widespread whereby local agencies take people from enterprises and institutions. Here unproductive expenditures of time and losses of labor are related to the shifting and lack of preparation of the work front and the fact that many workers cannot adapt to the performance of certain functions.

Since the enterprises must send part of their personnel to agricultural and other jobs, they try to maintain an above-plan number of workers. Such utilization of the labor force leads to inefficient expenditure of the most valuable quality of labor resources -- their skills.

What must be done in order to reduce losses of working time and improve the utilization of labor resources? Above all it is necessary to regulate sending them for agricultural work, to increase the responsibility for its organization, and to establish on the basis of agreements the mutual responsibilities of industrial and agricultural enterprises that are receiving and sending labor force. As for taking labor resources away for other jobs, this should be sharply curtailed.

An important reserve for the utilization of labor resources is the reduction of labor turnover. Appreciable improvement was made in 1980 when turnover in industry decreased, but then its level practically stabilized. Let us emphasize that not all shifting of labor forces can be regarded as a negative phenomenon. Transfer to work in a specialty, movement to work in regions where the labor force is inadequate and other similar shifts of labor force contribute to improvement of the utilization of workers. In the current understanding of this problem, the task consists not in "overcoming" turnover, but in reducing it to optimal amounts which provide for the most effective utilization of the labor force in the national economy.

A large reserve for better utilization of labor resources is the establishment of the optimal numbers of administrative and management personnel, the elimination of excess management units, and efficient utilization of personnel in branches of the nonindustrial sphere. In recent years this sphere has continued to grow at more rapid rates than the industrial sphere has. During the 1970's the number of people employed in the industrial sphere increased by 12.7 percent, and in the nonindustrial sphere -- by 33.8 percent.

#### Improving the Management of Labor Resources

Improvement of the utilization of labor resources is inseparably related to improvement of their management. The 26th CPSU Congress and the decree of the CPSU Central Committee and the USSR Council of Ministers, "On Improving the Planning and Stepping Up the Influence of the Economic Mechanism on Increasing the Efficiency of Production and Improving the Quality of Work," earmarked measures directed toward further improvement of planning and management of labor resources.

The USSR Gosplan has been instructed to submit to the USSR Council of Ministers as part of the drafts of the main directions for economic and social development for the decade, and also of the five-year and annual plans, the

balances of labor resources for the USSR and union republics, envisioning measures for providing the national economy with labor force. This work has been done since the beginning of the 11th Five-Year Plan.

The USSR State Committee for Labor and Social Problems, the republic committees and the local labor agencies have been instructed to submit to the planning agencies proposals and calculations for the balances of labor resources in the territorial cross section; to develop and implement economic and organizational measures for increasing planning in the distribution and redistribution of the labor force, reducing turnover and retaining personnel; to exercise regular control over effective utilization of labor resources in the national economy; and to render assistance in providing production associations (enterprises) and organizations with labor force and in placing workers who have been released. All these issues are resolved to one degree or another by labor agencies.

The greater role assigned to management of labor resources requires improvement of methodology and methods of planning them and improving the development of balances of labor resources.

In keeping with the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, the councils of ministers of the union and autonomous republics and the ispolkoms of the kray, oblast and city soviets of people's deputies must now develop long-range and annual balances of labor resources. But this work is not being done completely yet. Report balances are drawn up only for the krays and oblasts and their centers.

The establishment of limits on the numbers of workers and employees which industrial ministries, associations and enterprises can have in the five-year and annual plans for the economic development of the national economy is of great significance. This makes it possible to have better substantiation for the control of the distribution and utilization of labor resources, and to create an effective system of providing incentives for economizing on labor force in production, and also a system of economic sanctions for exceeding the established limits. The establishment of limits on the number of personnel is already producing certain results.

In 1982, as a result of the consideration of the applications from the krays and oblasts to raise the limits on the numbers of personnel, it was possible to reduce the demand for increasing the labor force in the RSFSR by 34 percent, and in the Lithuanian SSR -- by 25 percent. Moreover, approximately one-fifth of the industrial enterprises had exceeded the limits on the numbers of personnel in 1982. And this at a time when, according to data from a selective investigation conducted by the USSR Central Statistical Administration, approximately 20 percent of the new industrial enterprises which had not reached their planned capacities within the established time periods were not provided with skilled personnel.

An inspection shows that there are a number of shortcomings in determining the limits on the numbers of personnel. The main thing is that they are not always established taking into account the reserves for increasing labor

productivity or all measures for reducing labor-intensiveness and applying technically substantiated norms. The established penalties for exceeding the limit on the number of personnel -- reducing the remuneration for the results of the work of the enterprise during the year which is paid to management workers -- are not always applied. It would be expedient to establish a policy whereby the USSR Gosbank could issue to the industrial associations and enterprises wage funds for the production of productions obtained as a result of maintaining workers in excess of the limit only with the permission of the ministry (department), except for the production of consumer goods. Then these funds should be included in the overexpenditure of the wage fund with subsequent reimbursement under the established policy.

The planning practice exerts no small amount of influence on economizing on labor force. We are speaking primarily about normative planning of wages per ruble of output in the indicators of the NChP [normative net output]. The idea of this method of planning is to stimulate a savings on labor force at enterprises, since with this method the wages are determined irrespective of the number of personnel, on the basis of the production volume and normatives along. In the opinion of a group of directors of associations and enterprises with whom the USSR State Committee for Labor and Social Problems especially discussed the question, the idea of normative planning of wages per ruble of output is correct, but shortcomings in planning are impeding its implementation: frequent adjustments of the plans and the instability of the normatives. Therefore it seems that by providing for greater stability of the plans and normatives it would be possible to eliminate this impediment, and normative planning can and should be utilized extensively in our national economy in order to stimulate the performance of a greater volume of work with fewer personnel, for otherwise improvement of the economic mechanism is simply impossible.

There are also shortcomings in planning labor productivity. Recently we have established the practice of very irregular planning of labor productivity for the various quarters of the year and the various years of the five-year plan. We shall show this with the example of 1981. In the Union as a whole the annual plan for increasing labor productivity was 103.6 percent, including 102.1 percent in the first quarter and 105.1 percent in the fourth quarter. An even more telling picture can be found in certain ministries. Thus in the Ministry of Agricultural Machine Building in the first quarter the increase in labor productivity was planned in the amount of 100.4 percent and in the fourth quarter -- 111.5 percent.

Such a planning practice leads to a situation where during the first quarters the plans are fulfilled and overfulfilled, there is overpayment of bonus funds, but in the final analysis the annual plan is not fulfilled. This results in a deterioration of the relations between the growth of labor productivity and average earnings: in 1981 in industry labor productivity increased by 2.7 percent while average earnings increased by 2.3 percent; in 1982 labor productivity increased by 2.1 percent, and earnings, by 3.5 percent.

I should like to discuss one other issue: planning the ratio between workers and specialists for training. During the past five-year plan and the 2 years of the current one the number of specialists increased more than the number of workers and kolkhoz workers did, by 2.4 million. True, it is necessary to take into account that this took place not only as a result of extensive training of new specialists, but also as a result of the fact that now large contingents of workers are passing the limits of working age, and in their structure there were fewer specialists than the average for all age groups, and this increases the saturation of the branches of the national economy with specialists.

Because of this it would be expedient to revise the proportions in the training of workers and specialists. While understanding perfectly well the significance of training engineers and other specialists, one still cannot allow a situation wherein the training of workers is sharply curtailed.

An important unit in the management of labor resources is the system of labor placement. It began to take form in our country at the end of the 1960's in the form of a bureau for labor placement and information of the population. At the end of 1982 the network encompassed 830 cities and rural rayons. The bureaus exist in all union republics. During the years of the 10th Five-Year Plan the bureaus participated in placing almost 13 million people in enterprises and organizations, and during the past 2 years -- more than 6 million more people.

The bureaus render essential assistance in staffing the most important enterprises and startup projects with labor force. Moreover they contribute to providing the national economy with labor force by enlisting in public production pensioners, invalids who are capable of working, housewives and other groups of unemployed population.

The growing volume of work for labor placement and information of the population requires improvement of the forms and methods of conducting it on the basis of means of modern organizational and computer equipment. Approval should be given to the work that has been done to create automated control systems -- ASU Trudoustroystvo -- in a number of cities (Moscow, Tomsk, Ufa, Tashkent, Riga). Successful completion of this work will enable us to make the bureaus centers for complete and comprehensive information of the population concerning the need for personnel and available positions, centers which will effectively influence the formation and distribution of labor resources.

Because of the multifaceted nature of the problem of providing the national economy with labor resources, in November 1982 the USSR Gosplan, the USSR Gosstroy, the USSR State Committee for Labor and Social Problems, the USSR State Committee for Science and Technology, the USSR State Committee for Vocational and Technical Education, the USSR Central Statistical Administration and the AUCCTU adopted the decree, "On the Program of Work for Solving the Problem of Satisfying the Need of the National Economy for Labor Resources." The program that was approved earmarks basically the measures for solving this problem under the current five-year plan, and for a number of issues -- in the more distant future as well.



And one more remark. The problem under consideration is very complex, and it requires scientific research both on national economic problems and especially on branch and regional problems related to revealing reserves and improving the utilization of labor resources.

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## FUNCTION OF SMALL ELECTRONIC EQUIPMENT IN TECHNICAL PROGRESS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 39-56

[Article by L. N. Aleksandrov, doctor of physical and mathematical sciences, and E. Ye. Dagman, candidate of physical and mathematical sciences, Institute of Physics of Semiconductors of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Micro-Electronic Equipment -- A Catalyst for Technical Progress"]

[Text] By the middle of the century the number of kinds of items produced by industry had reached tens of millions, the complexity of the products had increased sharply, and the modernization of technical equipment and technology had accelerated. The scientific and technical revolution has set new tasks for management. Among them is a complex of tasks for controlling scientific and technical progress itself. If at one time the development of science and technology could be predicted essentially independently of national economic plans, now the situation has changed radically.

The average amount of time that lapses between a scientific discovery and its application in production, which amounted to dozens of years in the past, has now been reduced to 5 years, and in some cases -- to 1-2 years. Therefore economic plans must be constructed so as to immediately perceive and take advantage of the results of a discovery which promises an undoubted advantage.

One of the distinguishing features of the scientific and technical revolution is the complication of the structure of science, the intensive formation of ties among areas of science, the interpenetration of hypotheses, methods and results, the appearance of large ideas at the junctures of sciences, and the formation of new scientific disciplines. There is now a need to control the development of science itself as a direct productive force of society.

The role of knowledge as a productive force is steadily increasing. According to certain estimates, in the United States in the middle of the 1970's, in monetary terms the information product in all of its forms exceeded half of the production of goods. Foreign data show that during this period about 80 percent of the scientific institutions related the causes of their economic difficulties to shortcomings in the control of scientific research activity.

If one looks at the information component of science, there is a landslide of publications. Scientists and particularly managers are suffering from an information overload. Yet usually no more than 20-25 percent of the volume of information communication is real content. Thus it is important to filter information and eliminate surpluses of it.

Research shows that:

the volume of unused but potentially useful information increases geometrically in proportion to the number of scientists;

three-fourths of the applications for invention certificates turn out to be for duplicate inventions, and the percentage of repeat applications is increasing from year to year;

half of the time spent on scientific experiments goes for repeating them because the available literature has not been read;

even in the 1970's complete utilization of scientific and technical information would make it possible to reduce expenditures on scientific research by approximately 60 percent.

There promises to be a solution in automation of the acquisition, storage, processing, representation, transportation and documentation of information with the application of computer and communications equipment. A survey of the areas of scientific knowledge where revolutionary changes are taking place leads one to the conclusion that their current condition and prospects for development are conditioned to a significant, and frequently a decisive degree by automation of mental labor.

The utilization of electronic computers has provided for rapid progress primarily in those branches of knowledge whose development depends largely on mass calculations and computations. The difficulty and sometimes the practical impossibility of conducting complicated calculations until quite recently made it necessary to idealize phenomena of actual reality which were subject to mathematical analysis in order to simplify the differential equations that described them. Many factors were deliberately ignored, which lowered the level of scientific research. In technical decisions a limited number of variants were compared, as a result of which a satisfactory variant, but far from the optimal one, was adopted. The highly productive digital machines made it possible to sharply raise the level of scientific research and technical planning. The development of such branches of modern science and technology as atomic energy and reactive equipment would generally have been impossible without electronic computers.

The processing of large masses of information with electronic computers has become a condition for the creation of automated systems for control of the national economy. As we know, the complexity of administrative tasks depends on the number of ties among controlled objects, since one controls not objects but the links between them. And the number of ties is approximately proportional to the square of the number of interacting objects.

Additionally, the complexity of administration depends on how rapidly the ties change. New possibilities of interaction between man and information systems can radically increase the productivity of administrative workers, who number in the millions.

Automation of mental labor has thus become a kind of catalyst for progress.<sup>1</sup> A decisive means of automating intellectual activity is computer equipment based on electronic technology and micro- and optical electronics.

### Generations and Families

Computer equipment appeared little more than 30 years ago. Since that time there have been several generations of electronic computers (see figure 1). The first generation appeared at the beginning of the 1950's. Its element base: vacuum tubes and a memory of cathode ray tubes ( $10^4$  elements). The operating memory was 1-2 K words ( $K = 2^{10}$ ) and the relatively fast action when performing scientific and technical calculations was  $10^2 - 10^3$  operations per second. The second generation came at the end of the 1950's to the middle of the 1960's. The element base: discrete semiconductor and magnetic elements ( $10^5$  active circuit elements).

The history of micro-electronics begins in 1957. The new element base made it possible to sharply (2-3 times) increase the operating speed of the processors and the reliability of the systems, to reduce the sizes, to increase the density of the assembly, and to considerably reduce the relative cost and the consumed power. The assortment was expanded and the characteristics of peripheral equipment were improved. Magnetic disks became widespread in world practice. Problem-oriented algorithmic languages appeared; by 1967 there were already about 1,000 of them. The most widespread were ALGOL-60, FORTRAN and COBOL. Translating and operating systems are being developed. Multiprogramming, i.e. the multiprogram principle of operation, had the most essential influence on the second generation of computers.

Number of components  
on 1 crystal

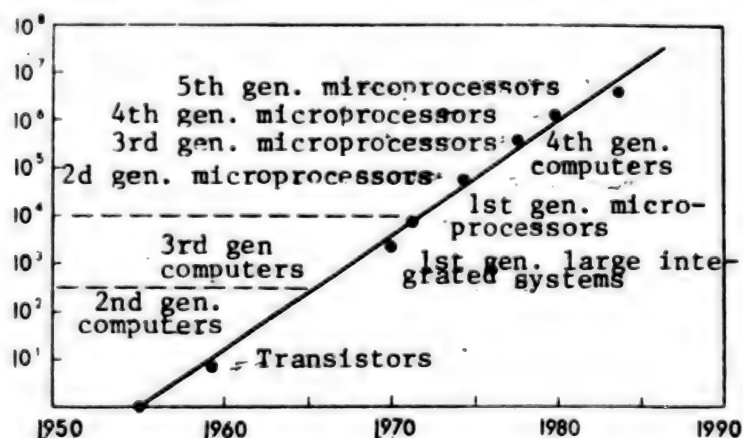


Figure 1. Generations of Electronic Computers

As a result, not only did the actual operating speed of the computers increase, but also conditions became developed in the middle of the 1960's for changing over to conditions whereby many subscribers could share time.

The creation of algorithmic languages contributed to a new approach to the development of electronic computers in the 1960's. Mathematical software became an equal partner with the hardware.

Multiprocessor systems also appeared. Electronic computers of the second generation began to be used for processing economic information. There were used extensively in control systems operating on a real time scale -- in aerospace systems and for control of continuous technological processes. In the industrially developed countries in 1967, 80 percent of the general-purpose computers were used as parts of information systems. General-purpose computers were used in industry, transportation, trade, the sphere of services and so forth.

Further development of micro-electronics involved the development of integrated circuits, and the sizes of their functional components with active (diodes, transistors) and passive (resistance, conductors, capacities) elements decreased rapidly. The needs of military aviation and especially space technology has a strong influence on the miniaturization of the equipment.

Integrated technology produced the element base for the third generation of electronic computers (the end of the 1960's -- the beginning of the 1970's). The peculiarity of these computers is the module principle of construction and the autonomous operation of individual elements. Complex operating systems appeared. The structure of the computer came to include communications processors and standardization of the linkage of computers with peripheral equipment and communications channels for operation with remote users in a dialogue. Multiprogramming and time sharing were developed extensively.

If the first and second generations of computers were specialized in either solving formalized problems or processing economic information, the third generation combined the two classes of machines for the first time. This brought about the development of new problem-oriented languages: ALGOL-68 and PL-1.

The technical specifications of the third generation of computers increased sharply, and automation of the design of integrated circuits (IC) reduced the cost of electronic equipment significantly. At the same time the relative cost of software increased, in the 1970's exceeding the expenditures on the development and production of computer equipment. This is explained both by the complication of the structure of computer systems and by the expansion of the sphere of their application. The third generation of computers typically has program compatible series and families of computers with a wide range of productivity: IBM-360, IBM-370, PDP-11, YeS-EVM, SM-EVM. In the second half of the 1960's there were many systems operating with time sharing dynamic allocator (TSDA) among subscribers.



The decisive factors in the high productivity were, first, multiprocessor organization through architectural decisions (parallel processing of information); second, miniaturization of systems; and, third, the application of high-speed circuit elements.

In addition to the output of series of small, medium and large electronic computers and the creation of super-powerful systems, minicomputers with a productivity at the level of the average class of the second generation also became widespread. In 1974 the cost of the output of minicomputers was no more than 10 percent of the world production of computers, but in terms of quantity they occupied the leading position both in production and the store of computer equipment being operated.

Among the key tendencies in the third generation one should include the unified (architectural) approach to designing series of computers; and the creation of systems on the basis of general-purpose computers that operate under conditions of TSDA. A most important advantage of this organization of computer work lies in the direct communication (dialogue) between the subscriber and computer during the course of problem solving, and the possibilities of logging the subscriber on to a computer at a time that is convenient for him and from any terminal, as well as the possibility of exchange of information among subscribers.

The simplification of contacts between man and machine stimulates the application of general-purpose computers. The development of TSDA systems in the developed countries in the 1960-1970's took place under the slogan: offer everyone individual means of communication with the national information computer network. It is though that the implementation of the program will make it possible to increase exponentially the productivity of scientific and other intellectual work.

In October 1982 the Carnegie-Mellon Institute concluded an agreement with IBM for the development of an improved network of personal computers. Up to 8,000 computers will be in operation on the campus so it will be possible to gain access to one anywhere. As a personal computer they selected a 32-bit computer with a virtual address space with a capacity of up to 1 billion bits. It has an operating speed of up to 1 million instructions per second; the volume of its main memory is from 500 K to 1 M. The graphic display with high resolution and element-by-element control of depiction makes it possible to input data both from a mouse and from a keyboard.

In terms of their significance for scientific and technical progress, the creation of time sharing systems and networks is comparable to the appearance of electronic computers themselves.

The spreading of electronic computers can be illustrated by facts we have taken from American sources for the simple reason that the accounts and publications in the United States are more accessible and complete than in other countries. In 1981 6.5 million new automobiles in the United States were equipped with microprocessors.<sup>2</sup> One corporation alone, General Motors (automotive industry), can produce 250,000 microprocessors a day. The

internal network for transmitting information in this multinational corporation joins together more than 500 electronic computers located in 100 cities in 18 countries of the world. One computer is added to the network each day.

There are more than 500,000 general-purpose computers in operation in the United States and their capacities are increased by 40 percent annually. There is reason to assume that this tendency will continue since the interdependency between the output of semiconductor devices and computer production is becoming stronger.

The tendencies traced through information from the United States are typical of all developed countries today, including the USSR.

#### Consolidation of Integrated Circuits

One of the tendencies in the development of integrated circuits (IC) has been consolidation of the placement of the elements and their integration. In 1978 they reached a level of integration of 260,000 elements per crystal. The annual 1.7-fold increase in complexity will apparently make it possible to pass the mark of  $10^6$  elements on one crystal in the 1980's. More than 500,000 elements are located on one silicon chip. They have already developed an experimental memory crystal with a capacity of 288 K, which is four times as much as the series produced memory. On a silicon chip with a diameter of 82 millimeters, they manufacture 65 of these crystals with a total capacity of 18,720 K.

Recently they managed to place 118 crystals on one ceramic base. When 704 circuits are placed on each crystal on one ceramic module, one can obtain 45,000 circuits with their registers and matrices.

The development of the J-11 supermicroprocessor can serve as an impressive example of the new tendency. It is two crystals which contain more than 138,000 transistors, which are located on a 60-contact 8-layer ceramic body, 7.62 X 33 millimeters in size. Occupying one-sixtieth the space, the J-11 superprocessor surpasses the popular PDP-11/70 minicomputer in terms of the set of instructions and operating speed. As a result, the cost of the computer systems are decreasing to one-twentieth the previous amount.

With the appearance of circuits with higher integration, the reliability has increased approximately 10-fold as compared to the circuits of 25 years ago. But designing crystals for 25,000 circuits and more remains a serious problem. How does one check to see whether or not the crystal works; and if a defect is discovered, how is it eliminated? It is clear that the superlarge IC's (SLIC) of the near future owe their appearance to automated design and testing, and this is impossible without computers.

The complexity of the IC crystals -- the pride of the electronics industry -- motivates them to concentrate attention and efforts on increasing the productivity of engineering labor. Automated design systems greatly facilitated the work of the developer. They make it possible to create

circuits consisting of millions of logical elements in approximately the way that a text is composed of prepared type in a printing house. Software is being created for automatic testing of the correctness of the prepared circuits.

And still the cost of a working position in the electronics industry is much less than in other, more mature branches. Thus in 1980 electronics firms spent an average of about 12,000 dollars on the acquisition of fixed production capital per worker, while in the automotive industry they spent 20,000 dollars, the chemical industry -- 46,000, and in the petroleum and gas industry -- 200,000 dollars. In order to reach a new level of productivity of engineering labor it will be necessary to essentially increase capital expenditures. According to estimates, by 1990 the average cost of a working position will have increased 10-fold and will be equal to the annual sum of wages and current expenditures on one engineer-developer, that is, it will reach 150,000 dollars. The fact is that the element saturation of semiconductor instruments continues to increase at a constant rate. The labor-intensiveness of developments and specifications is increasing even more rapidly. Additionally, when the duration of the design cycle is lengthened, the time period of operation of the items decreases because of obsolescence.

In 1983, 1.1 billion dollars' worth of equipment for automatic design systems was sold; and 28 percent of this amount was for electronic equipment (for designing IC's and printed circuits). By 1985, according to predictions, these sales will reach 4 and 1.1 billion dollars, respectively.

Today a considerable proportion of electronic automatic design systems are integrated stations for developing photographic templates and software for large computers. The sales of equipment for such engineering stations are increasing by 55 percent annually and by 1987 will reach the level of 680 million dollars.

According to rough estimates, 200,000 engineers in the world are engaged in designing BIS's and approximately as many are engaged in other kinds of design. In 1983 2,000 engineering stations were assembled for them, and by 1986 the number of stations installed each year will have increased to 9,000. If today only 3 percent of the engineer-developers have access to the stations, within a couple of years this proportion can increase to 80 percent.

#### Fourth Generation

Machines of the fourth generation are multiprocessor computers with superfast microcircuits based on superlarge integrated circuits (Fig. 1). In a place which previously accommodated one processor, it is possible to construct microprocessors out of tens and hundreds of them. The cost of the software is not increasing from 60 to 80 percent of the cost of the computer. Staff means are being made responsible for more of the problems that are currently being solved by software.

A special place (mainly because of the automation of design) will be held by tasks of processing graphic two- and three-dimensional information.



The speed of operation of the fourth-generation computers is measured in the hundreds of millions and even tens of billions of operations per second. By the middle of the 1980's developers will announce the appearance of a machine that takes advantage of the Josephson effect with an operating speed of the multiprocessor system of  $10^{11}$  operations per second. The capacity of the operating memory device (OMD) of the fourth-generation computer will exceed  $10^{12}$  bits, while today's memory holds  $10^{12} - 10^{13}$  bits.

Connecting computers to communications channels is becoming increasingly important. While up to this point communications channels were used mainly for remote input and output of information, for the fourth generation it will be especially important to have wide-range communications channels for organizing the joint operation of complicated computers that are territorially distant from one another. Local computer systems are beginning to merge into unified networks. Minicomputers are used as communications processors while large computers are used to perform scientific-technical and economic calculations and for modelling. Thus in order to solve problems related to research in meteorology, atomic physics or energy engineering, or to model aerodynamic, aerospace and other special tests, it is necessary to have computers with a productivity of billions and an operating memory device with more than 30 million words. In 1977-1978 work was started on creating such super-computers. One of them is the MPP processor of the Goodyear Aerospace Corporation with a productivity of from 216 million to 6 billion operations per second. The first model was installed in 1983. The processor is intended for processing graphic representations that come in from satellites. The satellite transmits about 500 pictures of the earth's surface during a day, which corresponds to approximately  $10^{13}$  bits of information. The processing of the pictures is necessary to predicting the weather, searching for mineral and water resources, analyzing the condition of agricultural crops and revealing areas where the atmosphere is polluted.

Microcomputers have appeared with processors for processing information, memory blocks and control systems. A microcomputer costing 130 rubles has reached the operating characteristics of the computer of the 1950's, which cost no less than 1,300,000 rubles. The use of computers has become economically advantageous, and their universality in combination with the possibility of reprogramming and feedback, their high reliability and their small consumption of energy have made them instruments for mass use. The number of microcomputers in the United States alone exceeds 1 million, and by the end of the 1980's it is expected that there will be 100 million of them.

#### From Microprocessor to Microcomputer

The first microprocessor appeared in 1970, the second generation -- by 1974, and in 1975 there appeared a third generation with improved architecture, an increased number of addressing conditions, faster operation, and an increased set of commands. In 1976-1977 the fourth generation of microprocessors appeared.

The level of integration of microprocessors has doubled every 2 years. Thus the best microprocessors of 1978 were equivalent to minicomputers with a

productivity of more than 500,000 operations per second with an operating memory of more than 1 megabyte. They can operate with high-level languages such as BASIC, FORTRAN and PASCAL. By the middle of the 1980's there will be a single-crystal variant of the large modern computers of the IBM-370 type.

The rapid increase in popularity of microprocessors and microcomputers has been possible because of successes in micro-electronics. Ten years ago it was difficult to imagine a pocket computer which could play chess better than 95 percent of the population ...

As distinct from ordinary computers, microcomputers are manufactured completely with integrated technology on a miniature crystal which is easily inserted into a machine tool, electric typewriter, electronic scales, cash register, microwave oven, automobile, stop light, complicated scientific instrument and many other devices.

Thus a microprocessor in the control unit of an electric engine makes it possible to save from 20 to 50 percent of the electric power. An engine with this kind of device is a little more expensive, but the additional expenditures are recouped within the first two years of operation, not to mention the prolonged service life of the electric motor. According to estimates of foreign specialists, the annual sales of such control modules will reach 100 million dollars in the next 5-6 years.

Microprocessor control promises much in telecommunications. The recently created RCA modem with a microprocessor on one plate 114 X 190 millimeters in size is capable of automatically forming signals and responses to them and transmitting information according to modified programs in a volume of about 1 K. The firm has introduced a new kind of service which makes it possible to use personal computers as terminals for the "Telex" service. As a result, personal computer users have the opportunity to access the computers of the RCA firm. A ramified network of subscriber communications is being organized which can be accessed simply by dialing a toll-free telephone number. It is also intended to provide for repeated transmission of information to terminals that are engaged, to transmit information to more than one address, and to call with a one-digit number.

Because of the success in the creation of highly productive microprocessor systems, the personal computer market has grown incredibly rapidly. There is a large assortment not only of equipment, but also of software, which comprises 35 percent of the sales. The range of software is extremely large -- from various kinds of games to complicated scientific and technical calculations. Thus for 75 dollars the scientific workers can acquire his own "electronic librarian." This is a software package which makes it possible to keep a catalog of literature with a personal computer. For example, it is possible to input complete information about magazine articles indicating the authors, headings and commentaries. Cross references to articles contained in the data base are made utilizing up to 12 key words. Information about 1,000 articles is stored on one disk. The program package also introduces a convenient "electronic editor"; a report module provides for the formulation and printing of any combination of information stored in the memory.

The development and manufacture of software is becoming a special branch of production and trade. The number of specialized trade firms is mushrooming: it is expected that their number will increase from the present 50 to several hundred in the next 2 years.

It is difficult to find a sphere of activity where a microprocessor or microcomputer cannot be used. Having enormous computer capabilities, the microcomputer with large series production is distinguished by low cost and small size. By changing the program, one and the same microcomputer can be used in many devices. This makes it possible to save a considerable amount of money, since such an instrument can replace up to 200 individual logic circuits. The microprocessor is thus one of those fortunate inventions which simultaneously reduce the cost of items and expand the possibilities of their application.

#### Toward the Next Generation of Computer Equipment

In order to progress it is necessary to develop scientific fundamentals for new technology and methods of controlling elements and microcircuits. Great hopes are being placed in optical electronics, in which an electric signal is transformed into a light signal or vice versa. Elements of optico-electronic computers were first applied for processing coherent radar signals. The optical processor is equivalent to hundreds of numerical blocks for processing information, which are operating in parallel. In 1 microsecond they can multiply  $10^8$  pairs of words up to 5 bits long and they can perform as many additions, which would correspond to transmitting  $10^{12}$  bits per second. Computers have not yet reached this speed, but optical calculators do not provide for precision of more than 1-10 percent, and their application is limited.

The element base of the fifth-generation machines will apparently make extensive use of optical electronic principles and devices: solid state lasers, light guides, photodiodes in optotrons which transmit signals in an optical range of electromagnetic waves, holographic memory with a density of registration of up to  $10^{11}$  bits per square centimeter, and the transmission of information in single pictures of no less than  $10^6$  bits, which even with frequencies of  $10^6$  hertz per second produces a speed of transmission of the  $10^{12}$  bits per second.

The predominant role of optico-electronic devices in the element base of computers of the fifth generation is attracting increased attention to gallium arsenide and other semiconductor materials made of compounds of group  $A_3B_5$ , which could replace silicon. Integrated circuits with GaAs, because of the great mobility of the bearers of the charge in them, exceed the mobility in silicon 100-fold, and even now they greatly surpass silicon in operating speed. The development of a new generation of BIS is still being held up by the complexity of the technology as well as the high cost of GaAs crystals, which is quite important because of the immense scale of computer production.

Integrated optics, which diffuse the light in thin-walled wave guides, has been developing since 1969. A combination of this and laser and optico-

electronic equipment along with micro-electronic technology will make it possible to approach the creation of computers with integrated-optical elements. Since the beginning of the 1970's, large firms (RCA, Hitachi, Philips, Toshiba, IBM and others) have been developing memory devices on optical disks.

The advantage of optical disks is apparent from this comparison: to store 10<sup>15</sup> bits of information it takes 1.35 million reels of magnetic tape (MT), which occupy a space of more than 3 hectares, while optic disks require only 1,000 reels and these can be fit into a space of 30 square meters. Moreover, information on magnetic tapes has to be retranscribed every 2 years, and on optic disks -- every 10-20 years. There are no longer any apparent obstacles to further progress of logic and memory circuits, at least in the next decade.

The recent anniversary 10th All-Union Conference on Micro-Electronics (Taganrog) and the 10th International Congress on Micro-Electronics (Munich) make it possible to judge the latest achievements of micro-electronics and the immediate prospects for its development. The congress was held on the territory of the international exhibition Elektronika-82, in which about 2,000 firms from 35 countries participated. The Soviet Union was represented by the foreign trade organization and a large group of scientists and specialists.

The papers and discussions at the congress were devoted to problems of applying micro-electronics in science and technology, tendencies in the development of matrix systems, program and circuit problems of microprocessors, problems of sensors, designing integrated circuits with computers, the directions of the development of micro-electronics, and economic evaluations of various circuit and technological decisions.

The paper entitled "Single-Crystal BIS for Translating Speech" (Nippon Electric) announced the creating of a circuit that is capable of translating from voice 128 individual, logically independent words. The time needed for the translation is no more than 0.7 seconds. Each word was analyzed three times, which increased the precision of recognition to 98 percent.

Problems of the development of micro-electronics in close connection with fundamental research and accelerated dissemination of computer equipment in production were discussed by A. V. Rzhakov, a corresponding member of the USSR Academy of Sciences. Until recently the role of fundamental science in the development of micro-electronics in our country has been limited to individual research projects which have either been of purely theoretical interest or have been associated with the solutions to specific problems. Only in recent years have we begun comprehensive research, in conjunction with academic and departmental scientific research institutes, on coordinated special-purpose programs and coordinated plans. Interdepartmental physics and technological laboratories are operating successfully. They combine the scientific potential of academic institutes with the technological capabilities of industrial scientific research institutes and scientific production associations.



The technical achievements are impressive, and they confirm the overall tendencies in the development of micro-electronics. There are, however, impediments, both specific and general in nature.

The complicated principles of constructing computers and processing information which were established in the past 30 years are a barrier on the path of the development of computer technology. Many of these principles will have to be revised in the next decade.

Another obstacle is the labor productivity of the programmers, which has increased slowly during the past 20 years --  $5\frac{1}{6}$ -fold, while the operating speed of electronic equipment has increased  $10\frac{7}{6}$ -fold. According to some data, during the past 30 years more than 100 billion dollars have been spent on programming (approximately as much as has been spent on all computers in the world). Therefore increasing the labor productivity of programmers is one of the principal tasks. The main reason for the arrears apparently lies in the fact that, as before, programming is more of an art than a science which develops according to rational principles. The computer is the most complicated of the devices created by man, and therefore programming can be regarded as an extremely complex kind of applied art. There is no doubt, however, that a way will be found to automate many stages in the creation of software. Three main areas of improvement can be singled out here:

circuit means of analyzing and debugging programs;

expansion of operating systems by means of developing and checking programs;

an increasingly high level of programming languages (PASCAL, S, FORTRAN).

Effective circuit and program means of developing programs are usually located within individual terminals which are equipped with microprocessors -- "intellectual" terminals. But the standard keyboard for feeding in information limits the productivity and the possibilities of introducing various types of information. By the middle of the 1980's it is expected that optical scanning devices will be widespread for introducing manuscript information and arbitrary depictions.

The sound channel of input-output of information also opens up large potential reserves for interaction between man and computer. Mini- and microcomputers now effectively synthesize speech information of fairly high quality.

Thus a historic revolution is taking place in the spiral of development. Computer technology is returning to man the gift of encyclopedicity, the ability to encompass in a glance systems of any size, to survey his unusually complicated but completely informationalized economy.

Artificial intelligence will come to the aid of man's intellect, which is no longer able to progress biologically at the rate at which the world is developing and becoming more complicated. The social consequences to which this will lead is a separate subject for contemplation.

# FOOTNOTES

1. Apokin, I. A., Maystro, L. Ye., "Razvitiye vychislitel'nykh mashin" [The Development of Computers], Moscow, "Nauka", 1974.
2. Branscomb, L. M., "Electronics and Computers: An Overview," SCIENCE, 1982, Vol 215, No 4534, pp 755-760.
3. Preston, K., "Kogerentnyye opticheskiye vychislitel'nyye mashiny" [Coherent Optical Computers], Moscow, "Mir", 1974.
4. Speiser, A. P., "Dokumentation 8 Intern. Kongress Mikroelektronik.," Munich, 1978, p. 1.
5. VESTNIK AN SSSR, 1982, No 2, pp 41-47.
6. SCIENCE, 1982, Vol 215, No 4534, pp 760-765.
7. Bailey, C., "Software Strengthens Development Tools," ELECTRON. DES., 1982, Vol 30, No 3, pp 77-84
8. Aleksandrov, L. N., "Integration of Sciences in Micro-Electronics," in the book: "Metodologicheskiye i filosofskiyе problemy sovremennoy fiziki" [Methodological and Philosophical Problems of Modern Physics], Novosibirsk, "Nauka", 1982.

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## ROLE OF ENTERPRISE IN PRODUCTION INTENSIFICATION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 p 57

[Introduction to articles that follow: "Intensification of Production: Much Can Be Done by the Enterprise Itself"]

[Text] One of the leading enterprises of Omsk, the synthetic rubber plant, is waging a struggle to keep the environment pure. The plant organization is a member of the All-Russian Society for the Protection of Nature. The enterprise has created 30 posts for monitoring the purity of the air.

As was pointed out at the November (1982) Plenum of the CPSU Central Committee, the increased effectiveness of the national economy is determined at all levels -- from the USSR Gosplan, the ministries and the departments to the enterprise. Special significance is attached to the primary units of the national economy. In the USSR law on labor collectives and increasing their role in the management of enterprises, institutions and organizations it is written that labor collectives are called upon to multiply the country's material and spiritual wealth and to utilize existing resources efficiently, that is, in other words, to follow a course toward intensification of production.

Enterprises of Omsk Oblast have a certain amount of experience in selecting the directions for intensification and following them. And this is shown by the materials we are publishing below.

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## INTENSIFICATION REGARDED AS MULTISTEP PROCESS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 58- 73

[Article by A. P. Mekerov, secretary of the Omsk CPSU Oblast Committee: "Components of Intensification"]

### [Text] Turning Point Period

In the economy of the oblast, as in the national economy as a whole, there are processes which can be regarded as typical of the turning point period. As was emphasized at the June (1983) Plenum of the CPSU Central Committee, the essence of this period consists in that "first of necessary to bring order into what we have and provide for the most intelligent utilization of the country's production and scientific-technical potential." The plenum named the changeover to intensive development and economical expenditure of resources as the main path to qualitative improvement of productive forces.

We are encountering the need to reduce the expenditure of resources to an even greater degree today. By the end of the 10th Five-Year Plan there was a shortage of more than 20,000 workers in industry. Because of the predicted reduction of the growth rates of labor resources and the startup of capacities that are already under construction, this figure will increase to 50,000 by 1985.

In the winter of 1981-1982 a shortage of electric energy was discovered. In spite of the fact that the production of it in Omsk in 1980 had increased by 20 percent as compared to 1975, only 60 percent of the electricity consumption came from the area's own sources, and during the first 2 years of the 11th Five-Year Plan it was necessary to spend more than 82 million rubles on capital investments to make up for this shortage. Electric energy availability for labor in industry increased by 12 percent during 1981-1982. But the shortage of electric energy was not covered by the area's own resources; it only decreased from 40 to 20 percent.

Among the characteristics of the turning point one can also include the critical need for strengthening planning, executive, technological and labor discipline. Unfortunately, cases of failure to fulfill plans are no



exceptions. For example, during 1981 the volume of industrial production in the oblast was to have increased by 5.6 percent, but the actual increase amounted to 4.3 percent. The increase in labor productivity reached only 84 percent of the planned level. In terms of production volume, 74 enterprises failed to reach the 1980 level, and in terms of labor productivity -- 65 enterprises, and neither the number of personnel nor the wage fund at them decreased. This year and in subsequent years, in addition to achieving the planned rates, it will be necessary to rectify the shortcomings of the first years of the 11th Five-Year Plan.

The economy cannot but experience the disparity between the growth of its potential and the reduction of the results of its utilization. During the years of the 10th Five-Year Plan alone, fixed production capital in the oblast increased by 30 percent, including in machine building -- 40 percent, the petrochemical and food industries -- 28 percent, and light industry -- 26 percent. The capital availability increased by 30 percent and the energy availability -- by 25 percent. Yet the production volume increased by only 23 percent during this period, and labor productivity -- by 16.8 percent. Thus the capital availability is increasing considerably more rapidly than the return from labor is.

The quantity of uninstalled equipment being stored in the warehouses or in the process of assembly increases from year to year. Millions of rubles' worth of imported equipment alone has not been installed, and the proportion of highly productive machines and equipment is small. The process of updating the active part of production capital is taking place slowly. Every fifth machine tool is from 10 to 15 years of age, and every sixth has been in operation for more than 15 years. The coefficient of shift work of equipment, even in machine building, in the oblast does not exceed 1.28. On the day of the inspection, 15 May 1980, 17 percent of the installed metal cutting equipment was not in operation. It is obviously necessary to change the approach to the production potential of industry.

One frequently has occasion to be convinced that the possibilities of intensification of production are not being seen at the enterprises. These possibilities are simply not recognized. Strengthening instruments is a direct path to intensification, but nobody takes this path. Yet many enterprises are making their own contribution to the "bank of intensification." It is only necessary for the rest to follow them in order to multiply the "contribution."

Are there factors capable of providing the necessary change in the functioning of industry in Omsk Oblast? Undoubtedly there are. These factors are science, technology and management.

#### Science

One of the forms of increasing the role of science is to conduct meetings, seminars and conferences jointly with the production workers. Practically all the key issues of improving economic activity, strengthening conditions of economy and thriftiness, scientific and economic progress, control of labor

resources, and increasing the social and labor activity of the population are discussed by the party organizations with the participation of scientists who help to develop scientifically substantiated recommendations. Many industrial enterprises hold scientific and practical conferences themselves. Thus the instrument building plant imeni Kozitskiy conducted a scientific and practical conference on the socio-psychological and sociological aspects of management of labor collectives.

In Omsk Oblast there is a large detachment of researchers and creators of new technical equipment, technologies, materials and scientific organization of labor. The work of a number of leading collectives has been studied and discussed at the bureau of the party obkom. The plans adopted by collectives of the leading enterprises have been complicated and interesting. These included institutes of "Microcryogenic Engineering," of the tire industry (NIKTI) and others.

In keeping with the plan for creative cooperation of the NIKTI, about 35 scientific research topics are being developed for the Omskshina Association. Designs of new equipment created by collectives of creative brigades are manufactured at the institute's experimental plant. Here one can find packaging equipment, screw conveyors, loading cabinets, vibrating screw feeders and so forth. An experimental model of an SPK-17 machine tool with a feeder was shown at the Khimiya-82 international exhibit and received good responses. The expected annual economic effect from the introduction of one of these machine tools is 75,000 rubles and 6 workers will be released. It is difficult to list all the examples of improvement of equipment and technological processes because there are so many of them. The annual effect from just one of them -- the technological process for manufacturing bicycle tire coverings from capron cord -- amounts to 1.3 million rubles for 5 million coverings.

We also have scientific developments for agricultural machine building. Thus the farms of the oblast are introducing a system of machines and equipment designed by the Siberian Scientific Research Institute of Agriculture for milking cows, which makes it possible to handle 100-150 head instead of 50 and to considerably improve the quality of the milk. Technological systems have been created for cultivating agricultural crops, including systems for grain crops which have been assimilated most. With their application the productivity of grain crops increased from 12.9 quintals per hectare under the 9th Five-Year Plan to 15 quintals under the 10th, labor expenditures per quintal dropped by 17 percent, and the profitability of grain rose to 75 percent. Even more appreciable results were obtained during the first 3 years of the 11th Five-Year Plan.

Toward what should the attention of scientists, designers and planners be primarily directed? Of course it is very important to create technical equipment and technologies that are oriented toward reducing the number of service personnel -- those which involve no people or few of them, which have few operations, and which are highly productive. There are examples of a successful solution to this problem in Omsk Oblast.

Another complex problem, in whose solution economists and sociologists in particular should participate, is the ratio between new construction and reconstruction. Taking into account the situation with respect to labor resources, major attention should be concentrated not on mechanical expansion of existing enterprises and construction of new ones, but on the technical re-equipment of industry, the kind of reconstruction which would make it possible to sharply raise the technical level of production and labor productivity.

In industry in the oblast there are many examples in which economic leaders and collectives are carrying out comprehensive renovation in existing production through their own forces. Well-thought-out renovation helps to solve many of today's crucial problems and to open up the bottlenecks. Renovation problems are being solved successfully by collectives of the synthetic rubber plant and the Omskshina production association.

During the past 10 years at the industrial carbon plant all of the fixed capital has been completely updated, modern equipment has been installed and progressive technology for the production of active and semi-active carbon has been assimilated. After the renovation the volume of production increased 2.8-fold, and the entire increase was obtained as a result of increasing labor productivity. The output-capital ratio increased. Expenditures per unit of output decreased by 10 percent. The Emblem of Quality is conferred on 90 percent of the products. The enterprise's profit increased exponentially. Just the highly productive machine tool 40/1, which was assimilated in 1982 and is equipped with reactors with a raw material load of up to 2 tons per hour, produces an annual economic effect of up to 1 million rubles.

Those who have proceeded boldly toward renovation without reducing production volumes have many concerns. Questions of renovation or the creation of new capacities should be considered in the stage of scientific and technical-economic substantiation, taking into account the real capabilities of the raw material base, energy engineering, transportation and labor resources. Such substantiation is not always provided.

The economic and social justification for the choice of paths to intensification of production requires special development. While supporting the idea of reconstruction, for example, we do not always back this up with economic stimuli, and we do not always manage to create a favorable socio-psychological atmosphere among the leading workers or around them. This is especially clear from the example of the Omsknefteorgsintez production association. Why did the introduction of the Shchekino method not finally end up successfully in this association? In addition to well-known, general factors, which were described in particular in the magazine EKO (1981, No 8, pp 108-137), a large role was played by the lack for the proper scientific socio-economic preparation. Initially the Shchekino method produced an appreciable effect, and this apparently slackened the attention paid to questions of working on plans for the future, which is inadmissible.

The image of production, its progressiveness and its effectiveness are determined by decisions included in the plans and the degree of their development. Today, unfortunately, it is becoming typical for new capacities

not to be put into operation for years because of the duration of construction and the inadequate financing, and as a result the equipment and planned technology become outdated. The delay in reaching the planned capacities is caused to a considerable degree by the illegality of construction projects, the introduction of so-called truncated startup complexes, where the client and the contractor, without proper and detailed analysis, exclude from the construction plan facilities which have a direct influence on the course of the assimilation of capacities. These shortcomings exist, for example, when production capacities are created for producing color television sets. The plants for plastics and industrial carbon have not created a reliable repair base or energy facilities.

#### Technical Equipment and Technology

Progress in industry is inseparably related to improvement of technical equipment for production. At the beginning of 1984 there were more than 2,000 automated and flow lines and mechanized shops, sections and productions in operation in plants and factories of the oblast. During the past 5 years, at machine building enterprises alone they have introduced into production almost 1,500 automated and semi-automated machines, manipulators, machine tools with numerical program control and other highly productive equipment. The television plant, Omskgidroprivod and other plants stand out especially in the area of technical re-equipment.

Mechanical processing has continued to be a bottleneck at the plant for sets of equipment because of the shortage of machine tool operators. From 1977 through 1 April 1983 the number of lathe operators, capstan lathe operators, drillers, polishers and other workers decreased by 11 percent. In order to solve the problem, the plant began to intensively introduce machine tools with numerical program control. The proportion of this equipment in the machine shops of the main production amounts to 15.5 percent. In five shops they have created special production groups of machine tools with numerical program control. The coefficient of shift work of the processing centers is 2.15. During the past 3 years the labor-intensiveness of machine processing has decreased by 225,000 norm-hours. It should be noted that the plant for sets of equipment has encountered a number of organizational difficulties for which it was not responsible, but this is another issue. The main thing is that with the help of technical equipment it is possible to solve the problem of the personnel shortage.

Good experience has been accumulated in the Vostok industrial cotton fabric association. The traditional technology of spinning and weaving has undergone essential changes and the classic spindle has been replaced by a pneumatic device, which has made it possible to reducing preparatory operations, to improve working conditions and to double output. More than 60 percent of the output is already being produced with the new technology. During the years of the 9th and 10th Five-Year Plans about 1,000 units of new equipment were installed; they comprise 80 percent of the equipment; and capital expenditures for these purposes amounted to 7 million rubles.



It would be wrong, however, to give only positive examples. In machine building there is extreme delay in the introduction and assimilation of powder metallurgy and automatic manipulators (incidentally, the party obkom has adopted a decree regarding this). A complicated process of increasing the durability of the instrument on the Bulat installation is being assimilated slowly. The efforts for applying laser and plasma and electronic ray technologies, and plastics, composition and other materials are far from adequate. The proportion of progressive smelting remains small. Every third worker in industry is an auxiliary worker -- a repairman. The outdated equipment requires greater and greater expenditures on maintenance. Every fifth worker performs all of his operations by hand. The mechanization of manual labor is proceeding especially unsatisfactorily in the meat and dairy, textile, food and light industries, and in assembly and auxiliary productions of machine building.

Technical progress in capital construction is very important for increasing labor productivity. Increased levels of prefabrication of buildings and structures, the introduction of progressive materials and designs, a reduced proportion of manual labor on the basis of the application of new machines and mechanisms, and improvement of the organization and technology of construction -- this is the path which Omsk construction workers are following. In 1980 the volume of fully prefabricated construction had increased by 17 percent as compared to 1976, and its proportion in the overall volume of construction and installation work increased to 70 percent. Still, labor productivity in construction organizations increased by only 2.8 percent during the 10th Five-Year Plan. Industrialization of construction work is developing slowly. Glavomskpromstroy is not dealing adequately with the development of its production base. Collectives of enterprises of the construction industry must assimilate and introduce progressive new materials, items and designs in short periods of time. It is necessary to arrange for extensive manufacture of elements made of economical arbolite cement -- reinforced concrete which is obtained with ash additives.

Efficiency experts and inventors are making their contribution to technical progress. During the years of the 10th Five-Year Plan in the oblast they utilized 120,000 efficiency proposals and inventions, with an economic effect of more than 200,000 million rubles. In 1981 Omsk Oblast was the winner of the all-union socialist competition for the achievement of the best indicators in efficiency and invention activity. But the indicators of the mass nature and effectiveness is dropping at a number of enterprises of the dairy industry, the Sibzavod imeni Bortsy revolyutsii, and the factory for initial processing of wool. Few inventions are being utilized in the Omskles and Omskmebel' associations or at the plastics plant. The reason is the inadequate development of the labor and social activity of the workers.

Under the current five-year plan the technical level at the enterprises has been revised for more than 99 percent of the items that are manufactured, the output of outdated products has been reduced by half, and the warranty periods have been increased for the majority of types of machines, mechanisms and equipment. But, as before, they are producing 9 million rubles' worth of products of the second category -- obsolete products which need to be

modernized. Outdated products are being produced by the Irtysh piano factory, the construction materials combine, and the plants for reinforced concrete items.

One might say that there is a wealth of reserves in technical equipment and technology. It work is needed in order to take advantage of them. Increasing the coefficient of shift work of equipment, for example, by one-tenth is tantamount to an annual addition of 50 million rubles worth of products. Such an achievement is not easy. The "human factor" in production plays a special role here.

## Labor

The Leninist requirement of learning to work, which was set forth during the first years of Soviet power, remains crucial today. Many enterprises can provide examples of highly productive labor. Take, for example, the motor construction production association imeni I. P. Baranov. Its leading workers and collectives of machine shops are initiators of the movement for reducing labor-intensiveness. It includes the entire collective of motor builders, by 1 April will already have changed over to norms planned for the fourth quarter. Under the 9th and 10th Five-Year Plans the association gained all of its increase in output without increasing the number of workers. The Shchekino method is actively utilized at the cardboard and rubberoid plant: 40 people were released and sent to other production sections. The rates of increase in labor productivity have been twice as great as the rates of increase in wages. All the products are certified as being in the highest and first quality categories, and the result of the brigade's work was shown at the Exhibition of the Achievements of the USSR National Economy.

But there are also collectives (the Omskstroyaterialy, Omskrybprom and Vtorchermet associations, the plant for bottling mineral water, and the plant for keramzit and reinforced concrete items) in which the wages are increasing more rapidly than labor productivity is, and the percentage of exceeding norms is high. During the 10th Five-Year Plan the number of industrial production personnel increased by 47 percent at the smelting-mechanics plant, the sheepskin-fur factory and the experimental industrial plant, but the production volume decreased considerably in the enterprises and the output-capital ratio also dropped. On the other hand, strict planning discipline and great demandingness are leading to stable economic success in the Omskshina, Vostok and Omskmebel' associations. Here they extensively apply comprehensive regulation of the service for working positions, they prepare the daily shift assignments well, and the equipment is arranged efficiently.

The synthetic rubber plant reached its planned capacities long ago. It would seem that everything had been taken into account long ago, but engineering research made it possible to reduce the volume of repair and restoration work, to eliminate a number of bottlenecks in technology, and to carry out the processes under optimal conditions. During the 10th Five-Year Plan the increase in production volume amounted to 12 percent, and the number of personnel employed decreased by 225. At the same time there are many enterprises which are operating under equally strict conditions, but are

complaining that all of their possibilities of improving production have been exhausted.

Success is achieved by those enterprises which search for and find their own means of increasing labor activity. In shop No 37 of the motor construction association, 2 years ago a brigade of machine tool operators was created, and it was headed by the communist N. I. Afonin. In it 10 men service 14 machine tools with numerical program control. There is no longer any division of parts into "advantageous" and "disadvantageous": all are now processed by everyone, and the equipment is not halted for readjustment. The system of wages was organized in such a way that engineering and technical personnel (electronic engineers, technologists) receive progressive piece-rate wages according to the results of the work of the brigade, and they have begun to solve technical problems more efficiently and improve technology more actively. They have also begun to motivate the workers to creativity, efficiency and invention. During 2 years labor productivity in the section has increased 1.5-fold, the amount of defective work has decreased sharply, and parts have begun to arrive for assembly more regularly. Nobody "from above" can force people to work this way, because a "chain of good work" has been created. There are 20 collectives like Afonin's in the shop.

In the decisive sections of industrial production 840 Komsomol youth brigades have been created. The oblast movement, "Komsomol Attention to Efficient Utilization of Equipment," includes 210 Komsomol youth brigades of machine tool workers, and 130 of them are working according to the brigade contract method.

Much is being done for collective organization of labor, whereby there is greater responsibility for the affairs of the enterprise, in the oxygen machine building plant, the television plant and the factory for carpet items. Labor productivity here is higher in the brigades which have councils and party groups, and where autonomous financing or the contract has been introduced. True, one cannot but note a marked pursuit to "embrace" a high percentage of the workers. Not enough attention is being devoted to qualitative improvement of collective forms of organization and stimulation of labor. The task of changing over to these under the 11th Five-Year Plan requires not simply "embracing," but introducing the brigade form as a system, including the restructuring of administration, planning, material and technical supply, norm setting and wages -- in a word, the fundamental preparatory work. We are convinced that without this one forfeits the true meaning of collectively organized labor, since it is equally possible to work poorly in a brigade and with a brigade.

Efficient utilization of labor resources is a most important factor in the intensification of production. Take labor turnover. As before, it introduces something random into the organization of production, and it causes disturbance of the rhythm, reduced labor productivity and increased nervousness in the collective. Losses related to the transfer of workers from one enterprise to another remain large -- an average of 15-20 days per one released worker. And tens of thousands of people each year are released from industry in the oblast and then find other work. Labor turnover is especially

high in the plants for gas equipment, metal items and detergents, and in the tobacco factory.

In order to reduce labor turnover, it is necessary to create the proper moral and psychological climate in the collectives, to be concerned about the working man, his needs and demands, to solve the housing problem, to construct children's preschool institutions, and so forth. When there is a turning point it is necessary to have an effective administrative lever for stabilization of personnel, namely a reduction of the number of personnel. Collectives are stabilized mainly in places where potentially unconscientious, undisciplined, excessively "mobile" workers are not hired. During the past five-year plan, for example, a marked reduction of the number of personnel was achieved by the motor builders, the Vostok association, the mineral items plant, the macaroni factory, and automotive repair plant No 4.

In the Vostok association social measures are carried out through internal means. In the production building they have opened a salon for ordering foodstuffs with an area of more than 200 square meters with 300 stalls. Each year the salon receives 400,000 orders for 700,000 rubles' worth of products. In the dining rooms on the busiest shift there are 3 people per place instead of the 4 according to the norm. Hot food is available during the night shift. The salon for household services which has been built in the corridor offers 20 kinds of services, of which it sells 100,000 rubles' worth annually. A medical point and a physiotherapy office with modern equipment have been opened in the production building. They have constructed 119 meters of heated passageways between buildings. The nonproduction area amounts to 1,000 square meters. They have released 43,000 square meters of housing, which made it possible to move 300 families from the barracks and to improve the living conditions for 900 families. There are now 1,200 textile workers living in well arranged dormitories. In the village there are shops, stores, a bath house, a laundry, a barber shop, a dining room, a cooking establishment, a cooperative trade organization, and a house of culture. All these were constructed through their own efforts. There is a sports complex, a swimming pool and many other things -- it is impossible to list all that the textile workers have created for themselves, with their own hands. Other collectives in light industry have something to live up to.

Reducing losses of working time constitutes a significant reserve for increasing labor productivity. Just because of these losses the oblast fails to receive a total of up to 50 million rubles' worth of products, which is as much as the gas equipment plant products in 5 years. Because of the inefficiency of the supply workers in providing metal, materials and batching items, idle time for entire days and between shifts amounts to more than 60,000 man-days. Losses related to administrative leaves are not decreasing either. Sick leave accounts for the failure to produce 140 million rubles' worth of products a year.

In a number of cases, for example at enterprises of the construction industry, wood processing and the radio equipment industry, the amount of sick leave is not decreasing. In certain productions the working conditions do not meet sanitary and hygienic norms. There is no doubt that a large role in improving



health is played by the sanitary and preventive facilities of the industrial enterprises. There are 21 dispensaries which can handle 2,280 patients in operation in the oblast. An analysis of the work of these health establishments shows their undoubted medical and economic effectiveness. More than 97 percent of the people who visit them leave with improved health. But the figures concerning the number of them are clearly inadequate. It is necessary to have sanitary and preventive facilities at enterprises of communications and energy engineering, the textile, light, timber, paper and wood processing industries, Sibzavod imeni Bortsy revolyutsii, the Omskgidroprivod plant and others.

The effectiveness of labor is determined largely by the training of personnel and the replacement of the working class. Many industrial enterprises of Omsk correctly proceed from the notion that they cannot stand to the side of the work of general educational schools and vocational and technical schools, that it is necessary to improve the forms and methods of labor education and occupational orientation of student youth and to accustom school children to socially useful labor at an early age. Among them is the motor construction plant, the plant imeni Popov, the television plant and Omskgidroprivod. They not only render material assistance to the schools, but also work together with them, so that patronage has been replaced by cooperation between the school and production collectives.

Good ties between the motor construction workers and schools of Oktyabr'skiy Rayon have been developing for many years. As early as 1961 the association took responsibility for patronage of five general educational schools, each of which is today assigned to one of the subdivisions of the enterprises. A council for vocational and technical orientation has been created. All the work is arranged according to the principle of shop-school, brigade-class, worker-pupil. The production brigades conclude agreements with the classes under their patronage for socialist competition under the motto: "Learn conscientiously, work without defects." In each of the schools under their patronage production shops have been created, which the patrons have supplied with all the necessary equipment. Labor training is supervised by specialists of the association. In the shops the students fill orders from the association, manufacturing fairly complicated products: water line valves which are in short supply, parts for spray guns and milk pumps. During 1980-1982, 136 graduates of the school came to work in the association and 162 went to other enterprises.

The experience of the motor builders was generalized by the party gorkom, and has been adopted by many labor and pedagogical collectives of the city. Senior classmen of schools in Leninskiy Rayon are taking production training in eight specialities in shops of the training and production combine. The combine is equipped with production shops and standard training laboratories. All the machine tool equipment is of the latest models. The shops are equipped with the necessary materials and cutting instruments. Students of the combine have training production practice directly in the shops of the plants, and in 1982 there were 750 of these students.



In Omsk there are 35 vocational-technical schools and technical schools. During the years of the 10th Five-Year Plan alone they trained 53,000 skilled workers. The best of them are technical schools Nos 22 and 56, and secondary vocational-technical schools Nos 3 and 46, which have as their bases the motor construction production association imeni I. P. Baranov, Omsknefteorgsintez, and the Zhelezobeton and Sibneftekhimmontazh trusts. These schools have a solid material base and experienced teaching personnel, and they have effectively arranged the training and educational process, and creative cooperation between training institutions and labor collectives.

On the whole Omsk workers have a good deal of positive experience in the sphere of improvement of labor organization, stabilization of personnel, personnel training, and increasing labor discipline. Its utilization and extensive dissemination constitute an important basis for intensification of production.

### Management

The slow growth rates of industrial production and labor productivity are explained to a certain degree by shortcomings in party and organizational-technical management of the enterprises and the drop in the level of state, production and labor discipline, and also feelings of responsibility on the part of certain managers for the fulfillment of plans and commitments, as well as omissions and mistakes in planning and material and technical supply. The VAZ method of organization and payment for labor, which was recommended in the decree of the party obkom, is being disseminated slowly. In spite of the creation of many dozens of ASUP's at enterprises of the oblast, the proportion of management workers has increased from 13 to 14.5 percent during the past 10 years.

The changeover to an improved management mechanism is being prolonged. As before, smelting, forging and nonstandard equipment are planned within the plant in tons. The majority of enterprises have developed the certificates which are required in keeping with the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, but not everywhere has this document become a means of eliminating the disproportions in the development of individual productions. Production management and party leadership are not sufficiently directed toward all-around economy on resources on the basis of the application of reduced-waste and wastefree technologies, energy-saving equipment, and the salvaging of byproducts and secondary resources. During the years of the 10th Five-Year Plan throughout the oblast the amount of electric power that was redistributed was enough to produce 50,000 transmissions.

Regardless of how significant the results of scientific and technical progress may be, the final result of their application, like the application itself, depend on improvement of management. This is the primary and major task facing the oblast party organization. When it is carried out, a number of other problems will automatically be solved. And here is where the experience of the leading collectives is important.

For example, the ASUP division was created at the television plant as far back as 1969. The first Minsk-32 computer was introduced in 1973. Initially the ASUP was used only for solving problems of operational planning. In 1983 there were already five computers functioning, and three of them were of the third generation. At the level of the shops they solve problems of calculating the shift assignment for the worker, the production assignment for the brigade and calculating the plan for the section and the shop as a whole. When planning assignments, control is exercised over the preparation of production in terms of the actual availability of fittings, materials, blue prints and the technical processes necessary for fulfilling the plan. A total of 216 problems are solved. Actually all workers are involved in the work of the ASUP. During the years of its operation the number of industrial production personnel has decreased by several dozen.

One must take note of the experience of the enterprises in economizing on material and technical resources. Orientation toward intensification of production was adopted by the Omsknefteorgsintez association. It consists particularly in more thorough processing of petroleum raw material. The task is to obtain more light products which the national economy needs and which are also more suitable for transportation than fuel oil is. The quality of the aircraft and diesel fuels obtained through secondary processes of catalytic and thermal cracking, coking of heavy residuals, hydrocracking and others is incomparably better than that from ordinary installations.

All these and other factors show the immense possibilities of stepping up intensification of production at enterprises of Omsk Oblast.

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## RENOVATION OF TIRE ASSOCIATION REPORTED, ANALYZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 73-80

[Article by P. V. Buderkin, general director of the Omskshina Association: "Advantages and Drawbacks of Renovation"]

[Text] In order to present the scale of the problems that arise during renovation one must give the characteristics of production in the Omskshina association. Today this is the largest enterprise of the tire industry, which produces more than 400 kinds of products. Our tires are used to "shoe" motor vehicles of the Minsk, Gorkiy and Ulyanov plants, and radial tires are produced for KamAZ vehicles and interurban buses, as well as Kovrov motorcycles, Penza bicycles, and much agricultural and road machinery. In 1981 Omsk tires were exported to 57 countries of the world.\*

More tires were manufactured during the 10th Five-Year Plan than during the first 20 years of the plant's operation; a 1-percent increase in the volume of output during the 10th Five-Year Plan is twice as much as the same indicator for the 8th Five-Year Plan. More than 85 percent of the tires have the State Emblem of Quality. According to evaluations of the Scientific Research Institute of the Tire Industry, Omsk tires for the Ural, MAZ and a number of other vehicles are the best domestic models. The mileage of Omsk radial tires for KamAZes exceeds 100,000 kilometers, and for buses -- 95,000 kilometers, which are the highest indicators in the country. The rapid dynamics of volumes that accompanied the increase in qualitative indicators, were based on an immense amount of work for the development of production and its technical improvement, and, the main thing, for renovation.

The collective adopted a decision to conduct renovation along with technical re-equipment of the enterprises without reducing, but, on the contrary, increasing the output of tires. Taking into account the capacities and capabilities of the construction organizations, it was impossible to do both at the same time. Therefore they decided that in the first stage they would carry out work that would not impede the normal functioning of the shops that

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\*For more detail about the Omskshina association see the book: "Delo, kotoromu sluzhish" [A Cause to Serve], Omsk, Omskoye kn. izd-vo, 1982. ed.

were in operation. The same basic formula was in effect in the subsequent, more responsible stages: not a single month without fulfillment of the state plan. The program and the schedules, which were developed in detail, reflected the specific features of our industry, but there is no point in describing them in detail. I shall say just a couple of words about the economic aspect of the matter. The renovation of the production for radial tires, which resulted in doubling the capacities, was instructive. Calculations showed that such an increase with existing production required only 700,000 rubles' worth of capital investments for each 100,000 tires, and with new construction these expenditures would increase 5-fold -- to 3-3.5 million rubles.

Having doubled the output of radial tires, we thought that the reserves for increasing capacities were exhausted. But the body of an automotive giant grew up on the banks of the Kama, and more powerful trucks were expected soon. And the Omsk tire makers received an important and responsible assignment -- to assimilate the production of tires for them. It was necessary to reconstruct the preparation section once again.

Here are the results of the reconstruction: during the years of the 9th and 10th Five-Year Plans the volume of production increased by 70 percent and labor productivity -- by 58.3 percent. In terms of production volume and the level of labor productivity, the enterprise has taken over one of the leading positions in the branch. On the whole, capital expenditures on renovation for 1,000 conventional tires are one-fourth the amount required for new construction.

One cannot but mention, however, that an enterprise that is carrying out renovation, with all its economic effectiveness, ends up in worse conditions. The fact is that the planning indicators do not account for losses, which are inevitable during a period of renovation. These include, in particular, those related to the lack of personnel and wage funds for work which the builders refuse to do, the reduced labor productivity because of work according to temporary plans, the increased labor-intensiveness because of the disturbance of the transportation flows, and many other things. For example, when organizing the third assembly shop in the buildings of the former inner tube shop and the shop for autoclave vulcanization, where only rubberized cords and protectors for electric cars are shipped, the labor-intensiveness of the manufacture of one tire increased 1.7-fold as compared to the first assembly shop.

Obviously, it is necessary to make certain adjustments and to change the attitude toward enterprises which because of renovation reduce capital expenditures on the output of additional products. For the increase during the past 10 years in our association has been tantamount to an additional plant which would have to be constructed, would have to hire 1,000 workers, for whom housing would have to be built, as well as kindergartens, medical institutions, sports complexes, movie theaters and so forth. But in addition to the moral satisfaction, the collective of the association has experienced and is experiencing many difficulties.

With the help of the renovation we managed to cope with the tasks of the 9th and 10th Five-Year Plans, but it is necessary to have prerequisites for more acceleration as well. So far, shortcomings are ensuing from our achievements. The plan for renovation, when submitted to the board of experts, is being deprived of many sections, pertaining, as a rule, to the development of warehousing, rail transportation, auxiliary services and so forth. As of today, for example, the shortage of warehouse facilities for costly raw and processed materials amounts to 20,000 square meters. Not to mention the final product. The situation with energy engineering is becoming increasingly critical, and the construction of steam and heat boilers is in arrears. In a word, we are dealing with a plan for renovation which is not comprehensive.

The management of the enterprise has to solve a multitude of problems which are external to the enterprise. For example, the construction workers are letting us down badly. They do not want to participate in the renovation of an existing enterprise, and one can understand this. Work for renovation is economically disadvantageous because production costs are higher and labor productivity is lower. The increased labor-intensiveness of construction and installation work and the reduced possibilities of using machines and mechanisms are not compensated for in any way. It is officially recognized that the output of construction workers in renovation decreases by 70 percent, while actually it decreases to one-half - one-third the ordinary level. And wages do not exceed 19 percent of the cost of the work. Therefore it is necessary to deliberately raise the cost of construction. The increased material-intensiveness of work for renovation is not taken into account either.

In addition to the material and moral harm to the construction workers, there is no compensation to the enterprise for the additional losses. In just one year the additional expenditures in the renovated shops of the association for which no reimbursement was made amounted to more than a half million rubles, including 100,000 rubles in wages. Technical re-equipment and material and technical supply are made more difficult.

One cannot but mention the normative acts, instructions, additions to them, adjustments and so forth. They say that bank workers have tried to calculate them, but gave up after 3,000. Frequently following the instructions in one paragraph constitutes a violation of those in another. We understand that instructions are a necessary thing. But still it is impossible to adapt a live, developing mechanism for control of the economy to the rigid forms expressed in instructions. On the contrary, the instructions should be adapted to the changing economic tasks. It is also necessary to have instructions which are based on confidence in people, which do not restrict initiative, but support it.

Technical renovation and higher economic indicators of the activity of the association are accompanied by and are simultaneously the basis for renovation that is based on a social program. The tire workers are pioneers in social planning. During the years of its implementation they have constructed almost 230,000 square meters of housing, a sanatorium and dispensary to accommodate 235, a house of recreation, a pioneer camp to accommodate 600, two secondary



schools for almost 3,000 students and a music school; a hospital complex with 450 beds for in patients and a polyclinic for 600 visitors; a stadium, a store and a cafe; hiring points, a consumer services combine, kindergartens and day nurseries which handle more than 3,000 children; dining rooms, refrigerators and refrigeration capacities which can handle 300 tons of meat. More than 2,500 hogs have been delivered to the Shinnik Sovkhoz for fattening.

The opportunities for therapy and recreation have increased considerably. During the past 10 years the number of passes, which are issued by the trade union committee, increased by more than 3,500 and in 1982 amounted to 7,500. Moreover, 3,000 children of workers of the association have had vacations on passes from the trade union committee. (True, it must be noted that the number of passes to all-union sanatoriums is decreasing, and they are given to Siberians during the winter and late autumn.) Some of the money for passes is taken from the social, cultural and domestic fund: about 230,000 rubles have been deducted during the past decade.

We are encountering difficulties in social as well as in technical renovation. This paradox arises: the more social, cultural and domestic institutions we construct, the worse it is for the social, cultural and domestic fund. Thus under the 9th Five-Year Plan the lion's share (about 2 million rubles) of the fund was spent on construction. But already under the 10th Five-Year Plan we had to reduce it to 1.3 million rubles. And the expenditures on maintaining the facilities that were constructed and acquiring equipment and supplies increased sharply, amounting to 70-80 percent of the overall expenditures. For example, 1.3 million rubles were spent on maintaining the sanatorium-dispensary. For this amount of money it would have been possible to construct an immense new sanatorium. In 1981 alone the association spent 238,000 rubles on maintaining the hospital of the Ministry of Health, including 149,000 rubles on capital repair.

The situation is no better with respect to the utilization of the development fund, which has recently come to be called the technical re-equipment fund. But the changes have not taken place in the name alone. First of all, we do not know today what the fund will be next year, but we must submit orders for equipment this year. In 1980 the fund for technical re-equipment was set for us in the amount of 7.4 million rubles, and in 1982 -- only 1 million. Yet the prices of equipment are increasing. Thus before 1972 a resin mixer cost 53,000 rubles, then 70,000, and according to the 1982 price list -- 109,000 rubles.

But there are not enough, even of these costly machines and mechanisms. Planning and design organizations of our branch have not yet developed a single industrial robot-manipulator. Practically nobody is engaged in planning means of mechanization and automation for loading and unloading work, warehouse operations or repair in the branch. Replacing second-category equipment with that of the first category provides for an increase of labor productivity when manufacturing truck tires of 35-40 percent, and replacing first-category equipment with that of the highest category -- 20-25 percent. If one takes into account the fact that most of the equipment in the association is of the first and second categories, updating it could provide,

according to the most modest calculations, for an increase in labor productivity of 40-45 percent.

For many years we have outpaced many enterprises in terms of technical re-equipment and the development of facilities for social, cultural and domestic purposes, but today they are beginning to overtake us both in the city and in the branch. It has become more difficult to operate. In 1981 Omskshina began to experience a shortage of personnel for the first time, and labor turnover stopped decreasing and amounted to more than 13 percent. The effects of the strip coefficient of wages is not being felt. Previously this was explained by the lower output of Siberian workers. Indeed, in 1965 we held 14th place in the tire industry in terms of labor productivity. Today we have risen to fourth place in terms of output, but we have remained in 14th place in terms of the average wage level.

Thus the experience of the Omskshina production association shows the considerable possibilities of renovation -- both technical and social. But this same experience shows that renovation should not undermine the basis for further development of the enterprise or its prospects. In other words, renovation should be comprehensive and continuous, and those who undertake it should receive incentives and a guarantee. This will produce considerable advantage for the national economy.

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## ADVANCED TECHNOLOGY PROVIDES BASIS FOR INTENSIFICATION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 81-87

[Article by A. N. Patrikeichev, head engineer of the Omsk Motor Construction Production Association imeni P. I. Baranov: "On the Basis of Advanced Technology"]

[Text] The motor construction workers could cope with the task of increasing the output of products without increasing the number of workers only with the help of technical re-equipment of production and improvement of labor organization. During the 10th Five-Year Plan and 2 years of the 11th, the production volume in the association doubled while the number of industrial production personnel decreased somewhat.

During 1976-1980 4,000 measures related to new technical equipment and scientific organization of labor were implemented, and work was completed on renovation of the majority of shops and sections and on their specialization. All this saved the labor of more than 3,500 workers, reduced the metal-intensiveness of the basic item by 1060 kilograms, and released 1,328 tons of metal in auxiliary production. The overall economic effect from the implementation of the measures amounted to more than 30 million rubles.

A significant role in increasing the effectiveness of production was played by the introduction of more than 500 units of highly productive equipment, including 180 machine tools with numerical program control. The greatest effect was achieved from modernization of grinding machines and adapting them for processing parts and instruments by electrical methods (electric-diamond, electric-contact) of processing. The application of these processes along with milling increased labor productivity 1.8-fold.

The milling machines with numerical program control that are produced today process the parts on only three coordinates and in production it is necessary to process many complicated parts on four coordinates. We succeeded in finding a solution and modernized the machine tool, which made it possible to transfer the complicated types of parts to multi-machine tool service and to increase labor productivity. But the success is mixed with dissatisfaction: we are dealing with problems of modernizing and manufacturing machine tool

equipment on an increasingly larger scale, expending a great deal of effort which could go for producing our basic product. Machine tool building enterprises produce the necessary equipment in extremely limited quantities. For example, each year we receive only 4-5 of the 26K20 lathes with numerical program control, which can be used at any enterprise. At these rates the re-equipment will take a long time.

The machine tool building industry produces milling equipment mainly for single-spindle processing. Without any changes in the sizes of the machine tool or the capacities, we can transform it into a four-spindle machine, thus achieving an increase in labor productivity. The same can be said about grinding machines.

An important area for creating conditions for multi-machine tool service is providing universal equipment with fittings for multiple positions and rapid action. During the years of the 10th Five-Year Plan alone, more than 300 universal machine tools were changed over to multi-machine tool service. During the last five-year plan we introduced nine automatic lines, including three for producing high-precision billets, 42 flow lines and mechanized sections, and 1,600 units of highly productive and fast-acting equipment. As of today more than 300 machine tools with numerical program control are being used to process parts and instruments with 4,500 operations.

In all of this work for re-equipping production we are receiving a great deal of assistance from our ministry. Suffice it to give this example: in the plant that was created in the association for transmission boxes for the Moskvich-412, with an annual output of more than 400,000, there are 36 automated lines and 25 flow lines in operation. The labor intensiveness of the manufacture of 252 parts and seven gears from them as well as the assembly of the boxes is 5.3 man-hours. It is not difficult to imagine how much equipment and how many people would be required if this production did not have such highly productive equipment.

One of the main areas for increasing labor productivity in the association is the introduction of new technological processes by our engineers and technologists. They have begun to use electrophysical and electrochemical processes for honing metal instead of milling and grinding; hydro-vibro-abrasive methods of processing instead of fitting work; and plasma methods of processing parts. It is well known how much labor and instruments, especially small-diameter drills, are needed to make threaded holes in slanting surfaces when producing large quantities of fasteners -- bolts, screws and nuts. We have introduced the electrophysical method, which has made it possible to change drilling operations over to multi-machine tool servicing and to eliminate manual labor for removing the burrs. Now on one installation we burn up to 70-80 holes in parts at the same time without subsequent metal polishing.

For us as for other enterprises, a most important problem was to search for ways of increasing the durability of cutting instruments so as to improve the cutting and increase the zone of service. To this end, the association has introduced and is using processes for finishing instruments such as ion-plasma



spray coating, boronizing, strengthening with a laser beam, and light nitrogen hardening. The durability of the instruments has increased 1.5-2-fold, and the amount of cutting -- 30 percent. This saves on costly instruments steel which contains wolfram, cobalt and chromium. Moreover, a section was created for processing wastes of costly materials, in which highly durable instruments are produced by isothermic stamping. It can process 12 tons of wastes per year.

In 1980 the association's work for economizing on metal was discussed in the bureau of the party obkom. The bureau drew attention to certain shortcomings, particularly in the utilization of reduced-waste technologies. In order to eliminate these shortcomings, special additional measures were developed for changing over to precision smelting and precision stamping, and improving existing technological processes and introducing new ones. The implementation of these measures made it possible to assimilate such processes as hot rolling, lamination and hydrodynamic extrusion. In 1981 a section was created for producing hard alloy plates manufactured by the association itself by the powder metallurgy method. Thus we solved the problem of satisfying our own needs for hard alloy plates. Each year it was becoming more difficult to obtain them from the outside, and the types and quality of them frequently did not suit us.

More than 700 kinds of parts are manufactured by methods of casting in molds and precision stamping, and all billets made of nonferrous metals are cast only in chill molds. But we still have many problems. The production of stamped billets still does not fully meet the requirements of the day for economizing on metal. The construction of the forge building has been delayed 4 years.

We are always looking for ways of using electronic computers more extensively for solving engineering problems. Computers are now being used to do a large number of calculations for designers, technologists and a number of other specialists when they are designing fittings and instruments as well as calculations related to mechanical processing, assembly and testing of the basic items. Computer equipment is also used to solve economic problems -- calculations related to labor and wages, including the nonorder system of daily accounting for the fulfillment of shift assignments, wages and bookkeeping. The acquisition of an immense amount of information regarding the composition and movement of personnel has been mechanized with the help of punch card equipment. The labor of engineering and technical personnel and employees is being mechanized. Incidentally, it is precisely their activity in competition and the implementation of their personal creative plans that constitute one of the foundations of technical progress. Each year because of this factor we receive more than 1 million rubles in conventional economic effect, and we save more than 650 tons of metals and about 700,000 kilowatt-hours of electric energy.

Modernization of equipment and the introduction of new technical equipment and technological processes -- not all of this has been created and invented by engineers and technologists of the association. We have a system of constant study of the advanced experience of other enterprises, exchange of plans for



new technical equipment, constant reciprocal information with related plants, and creative ties with many institutes of the country. Following the experience of leading enterprises, in 1979 we conducted an inventory of manual labor and earmarked a long-range plan for its mechanization under the 11th Five-Year Plan. The plan envisioned increasing the percentage of workers included in mechanized labor from 57 to 63 percent, releasing 250 people, and improving working conditions for 850 people. The most effective proved to be the hydro-vibro-abrasive methods of processing on specially created installations, which mechanized manual labor in metal working and increased productivity 1.5-2-fold.

Each year the association conducts a large amount of scientific research and experimental work in conjunction with branch institutes of the ministry, academic institutions and the Omsk Polytechnical Institute. There are no doubts about the results. In cooperation with the Institute of Electric Welding of the Ukrainian SSR Academy of Sciences imeni Ye. O. Paton, we developed an effective process of plasma cutting of metal which makes it possible to double labor productivity. A great effect is achieved from the application of the Bulat-ZT installation for strengthening instruments, which was developed by the Kharkov Physics and Technical Institute and was introduced in conjunction with Omsk scientists and engineers. An improved installation is now being assimilated.

Statistical methods of monitoring quality in automotive production which were introduced in cooperation with the polytechnical institute have reduced the volume of monitoring and improved the quality. The institute has created an experimental model of an instrument which measures the curvilinear surface of stamps and press forms with a laser beam, which makes it possible to manufacture them with greater precision.

At the same time one must say that both the branch and the academic institutes are slow in working to create cardinally new technological processes, especially in metal processing. It is difficult for the association to solve all these problems by itself. It is necessary to give science better motivation to solve the most important problems of technical re-equipment of production, especially in the creation and introduction of new technological processes.

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## IMPORTANCE OF MANAGEMENT IN PRODUCTION STRESSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 87-91

[Article by L. K. Trifonova, deputy director for economics of the Omsk Instrument Building Plant imeni Kizitskiy: "Improving Management"]

[Text] An instrument building plant has mainly series production of many products. Each year from 3 to 10 new items are introduced into production. The plants products are delivered to more than 1,000 consumers in about 100 ministries and departments, and 78 percent of the items go for cooperative trade within the ministry and main board. Difficult tasks have been set for us for the future: to increase output by an annual average of 10 percent. This means maintaining the rates that have been achieved: during the 10th Five-Year Plan the plant almost doubled its production volume, labor productivity increased 1.7-fold and the total profit from product sales increased 5-fold. Thus production management is not a simple matter.

It is usually more difficult to maintain high rates than to reach them. Through what? We cannot but note that at the plant losses of working time are still great, and the numbers of engineering and technical personnel and employees in the shops for auxiliary production are increasing more rapidly than in the basic production. The proportion of manual labor remains high, and it is difficult to organize brigades here. But perhaps the main reserve lies in the imperfect management.

The solution was suggested to us by the VAZ system of comprehensive solutions to problems of organizing production, labor and management, which is based on a principally new shop structure, concentration of auxiliary and service productions, centralization of administrative functions, deep specialization of engineering personnel, and extensive and comprehensive utilization of automated control systems and electronic computers.

The plant has developed and is implementing a plan of organizational and technical measures which concretizes the content of all preparatory work and the introduction of the system. A plant council and a working group for introducing the VAZ experience have been created and are performing their leadership, coordinational and executive functions. They began with an

explanation of the VAZ system and the creation of the appropriate psychological mood. It has been emphasized among the plant's party and economic aktiv and at shop and division meetings that the plant has no other way of increasing the efficiency of production and improving the quality of work. In keeping with an order for the entire plant, training has been conducted for managers of subdivisions, and an organizational system has been worked out for general training which presupposes reaching 100 percent of all the participants of existing forms of training at the enterprise with a study of the VAZ experience.

Higher management is familiarized with the VAZ system mainly in unionwide courses in Tolyatti where 20 specialists headed by the director have already taken training, and branch courses at the Perm Telephone Plant where 16 specialists have trained.

Having studied the fundamentals of the system, we came to understand that it cannot be simply adapted to old forms of management, preparation and service for production. It seems to us that the most important feature of the system is the way management problems are solved in it. In the complicated complex of production and economic activity of an industrial enterprise, this is perhaps the sphere that changes least of all. Technical equipment is updated regularly, progressive technology is introduced, and all enterprises are renovated and expanded. The makeup of means and methods of production changes strikingly, but the structure of intraplant production and administrative subdivisions remains the same, and they retain the traditional interaction and work methods which took form with the earlier kinds of technical equipment. Perhaps this arrangement satisfies the requirements for the development of production?

The answer is negative, and it is given by the development of production itself. Frequently the advantage in labor productivity achieved with the introduction of new technical equipment is completely lost because of the increased number of personnel needed to run it. The shop chief, for example, solves a number of problems, beginning with the fulfillment of the plan and ending with the education of the workers. It is hardly reasonable to expect that they will also solve all these problems completely and satisfactorily enough. Some are actually constantly on their minds while others, on the contrary, never enter their minds. Almost every shop chief considers that the main thing for him is the plan for the output of products, and the repair service, the supply of instruments and transportation do not receive the proper attention, even though the rhythmic operation of the shop depends precisely on these.

On the other hand the most skilled specialists of the functional services, who are capable of exerting an influence on increasing productivity, have not been given the necessary authority for this and frequently play the role of simple monitors. A multitude of examples can be given to confirm this.

In order to realize the most important elements of the VAZ system in production administration, the plant conducted an analysis of the existing system, revealed shortcomings in management, and determined the most important

areas and the sequence for restructuring. As a result, a plan was developed for the plant's organizational structure in its development during 1982-1985. It indicates in detail the areas for improving the technical preparation services and production service, the management of the basic production, material and technical supply, economic and transportation service, and the economics, organization and payment for labor as well as advancement.

The most deeply developed was the organizational structure of the head engineer's service, which envisions centralization of the head technologist's service, the creation of a comprehensive system for repair and service of technological equipment, and the introduction of principles of the VAZ system in the instrument and metrological service and the service for design planning for production.

When reorganizing the technological service we encountered certain difficulties which consisted not so much in determining the optimal level of centralization as in revealing the rational limits of the division of technical functions which are performed by shop technologists and which, according to the deep conviction of the production workers, should not be centralized. Apparently, to a certain degree these functions are "borderline" functions, but the standard structures existing today do not envision special positions for them.

Moreover, taking into account the aforementioned specific features of the production, it became clear to us that in the majority of main shops we will not manage to organize fully effective two-shift work in the near future. This means that the variant with the deputy shop chiefs for the various shifts is unacceptable. A decision was made to create and test out a section for preparation for production at one of the largest assembly shops, under the leadership of the deputy chief for technical problems. According to the results of the functioning of this section, final standard decisions will be made regarding shop management for the production shops.

They say that all one need do is start. The fact is that, having become familiar with the system, each manager creates his own mental image. All the difficulty now consists in that it is necessary to design a new model which is more suitable for production which takes advantage of the main principles of the VAZ system.

It is not a simple task, the more so since in practice the methodological materials for organizational planning of existing enterprises do not help much at the level of the shops. And even in the courses in Tolyatti themselves, they rely mainly on showing what the system as such is and how to change over to it. Under these conditions the main problems are solved by each enterprise independently, and most frequently by the trial-and-error method. This is obviously not the best way of studying and disseminating advanced experience in the management of industrial enterprises.

The system that exists at the plant for servicing the working positions of the main production, which is broken down according to structure and functions into shop and and general plant service, does not make it possible to organize



prompt and stable provision of the workers with everything they need for efficient and continuous labor, to introduce means of mechanization and progressive service normatives, or to achieve a significant reduction of intrashift idle time resulting from delayed service.

For our plant, as for many others of similar enterprises, the most acceptable basic condition for the introduction of regular service for working positions is the division of workers into functional groups and centralization of the services which actually provide service, which has been fully justified at VAZ. In 1983 it is intended to concentrate the functions of repair service for all technological equipment in the division and shop of the main mechanic. The work will be done by comprehensive brigades for repairing equipment. A specialized shop has been created for tidying up and landscaping work, and it has been made responsible for salvaging production wastes.

One of the most important elements of the VAZ organizational system is the complex of scientifically substantiated decisions in the area of labor organization and wages. It is based on the development and deepening of specialization and cooperation of labor in brigade forms, radical improvement of norm setting, and a principally new system of wages for workers. At the plant, 66 percent of the basic workers and 34 percent of the auxiliary production workers work in brigades (190 and 55 brigades, respectively). Of the total number of brigades, 45 percent are all-around brigades (the workers, as a rule, are assigned to the working positions). We have begun to analyze the existing brigades from the standpoint of the requirements which they must meet at VAZ. After implementing the earmarked measures, each brigade must be certified in keeping with these requirements.

An essential role is played by norm setting, which most frequently includes a time reserve for the worker. Norms frequently cover up poor labor organization, irregular supply, interruptions in the operation of equipment, negligence of the foreman, poor qualifications of the workers who perform the work, and a poor art of production. Improvement of norm setting will serve to improve not only the labor process, but also production, service and administration. We regard the preparation begun at the plant for certain technically substantiated norms (certification of equipment, refinement and improvement of technological processes, filling out charts of the working positions in terms of working conditions) not only as a constituent part of the VAZ system, but also as one of the most important means of achieving high labor productivity.

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## SIGNIFICANCE OF PSYCHOLOGICAL FACTOR IN PRODUCTION DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 92-94

[Article by T. L. Anisimova, chief of the twisting shop of the Vostok cotton fabric production association (Omsk): "The Psychological Climate in the Collective and Its Influence on Production"]

[Text] In our association production efficiency is increased primarily through technical re-equipment. But the introduction of new technical equipment is not a simple process, and it requires the assimilation of complicated new kinematic and electronic systems as well as the construction of new production areas. It is necessary to retrain personnel and accustom them to the new conditions. Additionally, there are a number of specific social problems which place the emphasis on controlling people, particularly the creation of a favorable socio-psychological climate.\*

Our shop has 450 workers; the average age is 26; every tenth worker is a communist; and 74 percent of them are Komsomol members. The shop has been awarded the titles "Collective of Communist Labor" and "Collective With Advanced Art of Production." The annual production volume, 3.3 million rubles, is no small figure. The equipment is largely outdated and there is no possibility of replacing it because machine building is not producing the kind our technology requires. Under these conditions it would be simply unthinkable to arrange for efficient interaction without favorable interrelations among workers of the shop. What is the basis of the formation of these interrelations?

There is nothing more important for creating the proper microclimate than providing a clear-cut delineation of the responsibilities of each and their mutual coordination. Therefore in the shop we have developed standard plans for the labor organization and the working positions of the basic and auxiliary occupations. The plans are constantly being updated. Thus when the

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\*The general director of the association, I. I. Podkovka, discusses in detail the experience in social development of the collective in her book "Na orbite pyatiletki" [In the Orbit of the Five-Year Plan], Moscow, "Legkaya i pishchevaya promyshlennost'", 1983. -- ed.

BD-200 machines were installed on the twisting machines it was necessary to reconstruct the feeding frames. The work zone of the twistors was increased 2-3-fold (depending on the assortment), and this means that the output increased as well. The twistors were relieved of auxiliary operations, which less skilled workers began to perform.

When the standard plans were introduced, most of the attention was concentrated on generalizing advanced work experience and training foremen and assistant foremen. Experience is passed on through schools of advanced practice, tutorship and "days of the innovator." Review-competitions of work mastery are held regularly in order to find out who the innovators and advanced workers are. Young specialists and workers are frequently the winners of the competitions.

One should take special note of the work of shift foremen and assistant foremen in the collectives. The majority of them are not only administrators or adjusters, but also true educators who help to solve any problems of their subordinates. This kind of attention has a positive effect on the mood of the workers.

There is strict control over the implementation of all measures, remarks and suggestions. The discipline of the leaders serves as an example for the workers. In party bureaus they hear reports from communists about the fulfillment of basic requirements, tutorship, and educational work in the complexes and on the shifts. In shop meetings they have reports from trade union group organizers and chairmen of commissions. All managers have long-range work plans.

Workers meetings provide a good training school. People go to them willingly, without being forced to, because essential issues that pertain to all are resolved there, and the contribution of each worker to the collective result is evaluated there. Each meeting begins with a discussion of what has been done regarding the suggestions of the previous meetings. This undoubtedly increases the authority of the workers' meeting.

When the personnel shortage becomes more critical it also becomes more difficult to attract new workers and retain those who are already there. From the first days of the formation of groups of twistors and winders in SGPTU-9 we have provided patronage for them and are assigning experienced tutors to them, who try to spend time with them not only in production, but also in daily life, in the dormitory, on cultural trips, and at parties and sports competitions. Thus a closeness is formed between the teachers and our reserve of workers.

Our work is not the easiest: the high temperature in the shop, the monotony and intensiveness, and the earnings which are less than in other shops. But workers do not leave us because of production factors or unsatisfactory relations. The main reasons for leaving are marriage or the impossibility of finding housing. This is our main problem: it is necessary to construct housing for young families.

The association conducts shop evening parties under the motto "A Social Portrait of the Shop." They try to reveal all the elements of the life of the collective and provide the best examples for youth. Performers, artists and writers are guests at the parties. A more frequent guest is the composer V. Yarkov, whose music we especially love.

With the socio-psychological climate that exists in the shop, we successfully fulfill our plans and socialist commitments.

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## INEFFICIENT UTILIZATION OF TIMBER PRODUCTS DECRIED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 95-102

[Article by A. I. Ivanenko, candidate of economic sciences, and G. Ya. Sukhanov, head engineer of USSR Sroybank administration (Moscow): "And This Is Planned Utilization of Timber?"]

[Text] Timber is a most important constituent part of the national wealth, and it should be utilized efficiently in the interests of the national economy. This was noted at one of the meetings of the Politbureau of the CPSU Central Committee during a discussion of the question of improving the utilization of timber in the country and the basic directions for the development of the timber complex during the 12th Five-Year Plan and subsequently. But it was also noted there that enterprises of the Minlesbumprom [Ministry of the Timber, Pulp and Paper, and Wood Processing Industry] were slow in carrying out work to improve the structure of production, to increase the output of wood products and the improvement the technology for processing timber, and it also noted that wastes from timber procurement and wood processing are great."

Under the 10th Five-Year Plan the timber, wood processing and pulp and paper industry increased the commercial output by 9 percent, and the volumes of imported timber decreased by 12 percent. It would seem that in such a situation there should be a change in the attitude toward timber wastes and toward the development of processing. According to data of the leading institute of the USSR Minlesbumprom, the VNIPIEILesprom, each year there are 95-100 million cubic meters of timber wastes in the country, which amounts to 26-28 percent of the timber that is procured. Half of the wastes are not utilized in general, even though they could be raw material for pulp and paper and wood processing enterprises.

Analysis shows that the output of these products is increased mainly with full-value wood. For example, during the past 10 years the output of fiberboard and chipboard slabs has increased 2.3- and 2.7-fold, respectively, but the utilization of wastes in their production has increased only 1.7-fold.



During the past 5 years there has been no increase in the volume of wastes used for the hydrolysis industry or the production of industrial chips for the pulp and paper industry. Yet these productions are the main consumers of timber wastes.

No significant improvement in their utilization is envisioned for the current five-year plan. In 1985 only 39 percent of the wastes will be used for industrial purposes, as compared to 30 percent in 1980.

What are the main reasons for such a situation?

Up to this point we have retained the policy for determining the supplies of timber for raw material bases of timber procurement enterprises, whereby only part of the tree trunk is taken into account. The top, the branches and the roots are not taken into account even though they comprise an average of 7-10 percent of the mass of the tree and are full-value raw material. As a result, their shipment from the felling areas is not taken into account when developing plans.

The Irkutsk branch of the Giprolestrans [Main Administration of Timber Transportation] of the USSR Minlesbumprom has developed plans for eight timber industry enterprises, which are to be a part of the timber raw material base for the Ust-Ilim LPK [Lumber Industry Complex]. Only in one of them (the Educhanskiy timber industry enterprise) have they envisioned gathering and processing saw mill wastes with the delivery of the industrial chips that are obtained to the Ust-Ilim LPK. But even at this enterprise they have not organized the gathering of the wastes. Of the 17 plans for timber procurement enterprises developed by institutes of the USSR Minlesbumprom for construction in 1981-1984, the utilization of milling wastes has not been envisioned for 11 (68 percent).

Nor are there any norms for the utilization of wastes at the lower warehouses of the timber procurement enterprises, where the timber is prepared. The same thing can be observed at milling and wood processing enterprises.

After the renovation of the Neva furniture combine in Leningrad, each year a volume of 43,000 cubic meters of sawdust will be thrown into the dumps, even though there are many enterprises in the oblast that produce pulp and paper and chipboard. For example, one of the Leningrad associations for producing fiberboard and chipboard annually ships in 30,000 cubic meters of industrial scrap wood instead of utilizing the wastes from the Neva combine.

Accounting for all resources and developing norms for the utilization of wastes are especially important for nonspecialized ministries where the level of utilization of wastes is even lower. If in the USSR Minlesbumprom 45 percent of the wastes from milling and wood processing go for industrial purposes, in the Ministry of Transport Construction it is 4.4 percent, the Ministry of the Coal Industry -- 4.8 percent, the Ministry of Rural Construction -- 13.5 percent and the Ministry of Construction -- 15.2 percent.

The policy whereby the USSR ministries and departments and the councils of ministers of the union republics as well as the organizations under their

jurisdiction must coordinate with the USSR Minlesbumprom (or its republic ministries and associations) the distribution, planning and construction of new enterprises of the timber, pulp and paper, or wood processing industry, or the expansion of existing ones, is most frequently not observed. It is necessary to make a radical change in the attitude toward wastes at all enterprises that utilize timber raw material, including enterprises of the USSR Minlesbumprom.

Even in cases where the utilization of wastes does not require significant expenditures and efforts, the USSR Minlesbumprom does not use them in production. A realistic way of utilizing soft wastes of timber and roots of trees is to manufacture fuel briquettes, which is already being done extensively in the United States and Canada and is producing a good deal of profit. We too have experience in this. Two years ago at the Kirov timber base we constructed a special shop with a capacity of 5,400 tons of fuel briquettes a year. Expenditures on its construction amounted to only 123,000 rubles. But in spite of the existing experience, we are not developing the practice of transforming wastes into briquettes. And yet at the present time 0.8 million cubic meters of firewood are being shipped to the Ukraine, Kazakhstan, the Tatar and Chuvash ASSR's and Krasnodar Kray alone, even though in these regions there are 1.5 million cubic meters of unutilized sawmill wastes which are suitable for making briquettes.

Of the 30 million cubic meters of lumber wastes that are formed annually, only 5.6 million or 19 percent are utilized. The level of utilization of these wastes could be raised considerably with mobile felling machines. The experience of the USSR Minlesbumprom in applying mobile felling machines imported from Finland and also experimental models of domestic machines shows their high effectiveness.

But the ministry has not been able to expand the utilization of progressive technology. In 1982 the Izhevsk experimental plant, which is under the jurisdiction of the USSR Minlesbumprom, manufactured only 10 sets of these machines with an overall capacity of 150,000 cubic meters. Yet just in the Ukraine, Belorussia, the Baltic states and the Karelian ASSR, where the conditions exist for the utilization of industrial chips, they annually lose 2 million cubic meters of wastes from felling and trees from prophylactic fellings.

Another raw material base for the production of cardboard and paper, in addition to wood, is waste paper. Proportional capital investments in the production of paper and cardboard from waste paper are half as much as when they are produced from wood. Only 25 percent of the paper and cardboard that are produced are returned for secondary processing as waste paper. At the same time in Western Europe this indicator amounts to 40 percent. If the gathering and processing of waste paper were to be raised to this level in our country, this would provide for an annual savings of approximately 5.4 million cubic meters of timber raw material.

Initially the ministry was given the assignment of increasing the volume of annual utilization of waste paper during the 11th Five-Year Plan by 450,000 tons or 35 percent. But the ministry's plans included an increase of only

252,000 tons. As a result, the national economy will need to bring an additional 1 million cubic meters of timber raw material into production annually. It has already been 9 years since the technology for cooking sawdust into pulp was developed. But until recently it has not been applied in practice even though in the northwestern region of the USSR alone it is possible to utilize 4 million cubic meters of wastes annually, and in Perm Oblast -- 0.9 million cubic meters. From them it is possible to obtain 1 million tons of pulp, that is, 12 percent of the country's annual output.

Using wastes in production and reducing losses when procuring and processing timber depend largely on the time periods for the construction of enterprises for comprehensive processing of timber raw material. During the 10th Five-Year Plan we produced less chipboard and fiberboard than was envisioned by the five-year plan. As a result of the slow construction of composition board enterprises, about 10 million cubic meters of wastes were not used in production. The plan for capital investment for composition board enterprises was fulfilled by 67 percent, and the plan for starting up capacities was fulfilled to an even lesser degree. Startup deadlines were not met at 32 of the 37 composition board enterprises that were introduced during the 9th and 10th Five-Year Plans. The average duration of construction was twice the normative amount of time.

Capacities for producing industrial chips from wastes are also being constructed slowly. The plan for their startup under the past five-year plan was fulfilled by 44 percent. In spite of the overall insignificant duration of construction for producing industrial chips, 14 enterprises that were started under the 5th Five-Year Plan were not put into operation under the 10th Five-Year Plan, and their startup deadlines had to be postponed to the 11th. Yet a number of enterprises of the pulp and paper industry (the Neman, Kaliningrad, Arkhangelsk, Solombalskiy and Turinsk pulp and paper combines) are experience a critical need for industrial chips, as a result of which the production plans are not being fulfilled.

The slow startup of capacities is brought about by a violation of the existing policy for planning capital construction and shortcomings in the organization of construction production. The USSR Minlesbumprom regularly allows deviations from the assignments set by the initial title lists. Thus in 1982 they failed to provide 16 percent of the capital investments allotted for the construction of 16 enterprises for producing composition board slabs. These construction projects again failed to receive the full amount of capital investments allotted according to the plan for 1983. The same thing is happening with respect to the construction of timber industry enterprises, whose plans envision the utilization of wastes for producing chips. Two-thirds of the aforementioned construction projects are being carried out by organizations of the USSR Minlesbumprom. It is precisely in the objects that one finds the greatest arrears. For example, the deadline for the startup of the Maksatikha plant for fiberboard slabs in Kalinin Oblast was postponed 6 times since the construction administration of the Kalinindrev association of the USSR Minlesbumprom regularly fails to fulfill its work plans.

Another reason for the delay in the construction of enterprises is the violation of deadlines along with the poor quality of planning. In the

construction of the Maksatikha plant, for example, there were large differences between the technical plan and the estimates for the blueprints. In 1981 the documents were reapproved with an increase in the estimated cost of 3 million rubles.

During 1976-1981 planning estimates were revised for 34 large construction projects of the timber procurement and wood processing industry of the USSR Minlesbumprom, with an increase in estimated cost of 131.1 million rubles or 21 percent of the initial cost, which entailed a prolongation of the time periods for construction.

An inspection showed that even in those cases where the planners of the enterprises envision comprehensive processing of timber raw material, in the process of construction there is a delay in the building of the corresponding productions, and as a result of the uncoordinated startup, comprehensive processing is not provided for.

At the Ust-Ilim timber industry complex they violated the technological sequence of the startup of joint capacities. In 1980-1982 capacities were introduced for producing 550,000 tons of commercial pulp, the raw material for which, according to the plan, was low-grade timber and wastes from the sawmill and wood processing combine that was constructed as a part of the complex. This combine is not to be brought up to full capacity until 1985, and therefore the problem of comprehensive processing of raw material will not be solved under the current five-year plan. Pulp is now being produced from high-quality wood. As a result, the national economy loses 25 rubles on each cubic meter of timber, and 150 rubles on each ton of pulp that is produced.

At sawmills and outdoor areas for cutting up logs of the Bratsk timber industry complex, up to 300,000 cubic meters of sawdust are formed each year. According to the plan, this sawdust should be used as raw material for the hydrolysis plant. But the amount of time for constructing it has been drawn out. With an estimated cost of 45.3 million rubles, as of 1 January 1983 only 1.1 million rubles had been assimilated. The introduction of the first startup complex is planned for 1984. At the present time almost all the sawdust is taken to the dump and burned.

The startup of capacities for producing industrial chips when timber industry enterprises are constructed, as a rule, lags behind the startup of capacities for producing timber. This in the 19 timber industry enterprises that were inspected, 64 percent of the planned capacities for producing timber were introduced, and only 18 percent of the capacities for producing industrial chips. As a result, the sawmill wastes and the wastes from dressing the timber are not utilized in these timber industry enterprises.

According to data of the USSR Central Statistical Administration, in 1981 at 99 of the 286 facilities of the USSR Minlesbumprom which were inspected, the normative time periods for assimilation had expired and the planned capacities were not being fully utilized. These delays made it impossible to use 2 million cubic meters of wastes in production and led to a loss of 230 million rubles' worth of products.



The reasons for the unsatisfactory assimilation of capacities at enterprises of the branch are the shortages of raw material and the lack of coordination of production. According to the plan, the Tomsk plant for chipboard slabs with a capacity of 110,000 cubic meters a year, which was put into operation in 1980, was to use as raw material wastes from milling and wood processing at four enterprises of Tomsk. But in reality only the Tomsk LPK delivers raw material, and the rest of the enterprises have not organized this. As a result, during a year and a half they produced 53,000 cubic meters of slab less than the norms called for, with a monetary loss of 5.9 million rubles.

Comprehensive utilization of raw material depends also on the organization of accounting. Now nobody knows precisely the scale of the losses of timber raw material. The methods for drawing up statistical reports require including in the report data about existing timber wastes only in terms of the volumes of their actual utilization. According to the existing instructions, the volumes of economically available wastes do not include wastes from enterprises with small capacities. As a result, the report does not reflect the reality and creates the appearance that all is well.

Calculations of the institute of the VNIPIELesprom show that the annual resources of timber wastes amount to 95-100 million cubic meters, while the statistics account for only 55-60 million cubic meters. There are especially large divergences in timber procurements where the calculated resources of timber wastes exceed the volumes accounted for in the statistical report more than 3-fold.

Technical equipment and production technology which make it possible to provide for comprehensive utilization of timber raw material have been developed in our country. Only organization is needed.

The existing situation shows that the economic mechanism that is in effect, and the methods of planning, price setting and stimulation in industry, construction and planning do not direct us sufficiently toward full utilization of timber raw material. As was stated at the June (1983) Plenum of the CPSU Central Committee, "it is necessary for the struggle for economy and thriftiness to be based on a well-thought-out system of material and moral incentives." Only on this basis is it possible to reach a solution to the problem. Otherwise, certain specific problems will be replaced by others. This is the first condition.

The second condition is the solution to a number of urgent specific problems in the development of production, a considerable number of which have been presented above. Their solution requires the efforts of the USSR Gosplan, the USSR Minlesbumprom, and all ministries and departments that are involved in the development of the timber, wood processing, and pulp and paper industry. In order to coordinate all these efforts, it would be expedient to develop a program of joint actions.

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## WORK FOR IMPROVING PSYCHOLOGICAL FACTORS DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 103-111

[Article by V. Ya. Belen'kiy, chief of the branch laboratory for social planning, sociological research and psychophysiology of labor in the tire industry (Dnepropetrovsk): "A Good Mood -- A Production Reserve"]

[Text] The June (1983) Plenum of the CPSU Central Committee devoted a great deal of attention in its decree to the provision of publicity, the elimination of bureaucratism and formalism in personnel work, and democratization of administrative decisions that are made. Of no small significance in the implementation of the decree is the experience of the collectives of the enterprises in work with applications and complaints from workers, which has been accumulated, in particular, in Dnepropetrovsk. Here many enterprises have created "attention services," "good mood services," and so forth, whose task is to ensure a normal moral and psychological climate in the labor collectives, one which contributes to solving a dual problem -- increasing labor productivity and promoting the all-around development of the personality of the worker. The article published below presents the work experiences of the "good mood service" of the Dneproshin production association.

Have you ever thought about how important the factor of the worker's mood is under the conditions of production which is constantly becoming more complicated? All you need do is take a close look at the moods of you comrades and coworkers and you can tell with a great degree of reliability whether or not their labor will be productive and joyful. If one were to set the goal of determining all the components of a good mood for the worker, it would hardly be possible to reach this goal -- the relations of people in production are so diverse and complex, the moods of each of us are so changeable. And yet the mood, the moral and psychological microclimate in the collective, the art of job interrelations -- these constitute a significant and fairly appreciable reserve for the development of production. The constant attention to the problem of creating a favorable mood is explained

simply: experimental data of Soviet psychologists show that with a good emotional mood, the labor productivity of the worker increases by an average of one-fifth.

Today new sociopsychological services for mood, attention, confidence and responsiveness have been created in more than 70 enterprises of Dnepropetrovsk and in many production collectives of the oblast. Perhaps especially interesting in this connection is the experience of the Dneproshin production association imeni XXV S"yezda KPSS. The work of its party organization for increasing production efficiency and improving the quality of the products that are produced was approved in a decree of the CPSU Central Committee which was adopted on 4 January 1983. On the initiative of the general director, V. P. Kuznetsov, in 1981 on the basis of a small sociological subdivision the enterprise created a branch scientific research laboratory for social planning, sociological research and the psychophysiology of labor. One of the most important practical tasks of this laboratory was the organization of the "Good Mood Service." It is receiving input from three sources.

First -- registrations of suggestions, complaints and questions on signal cards which are kept in boxes that are hung on the wall in special show cases. The show cases inform people about the content of the work of the service, the policy for applying to it, and the forms of responses to questions. This form of communication makes it possible for the worker to remain Mr. X, as it were, that is, not to give his name. In order to ensure complete anonymity, the sociologists have located the boxes on the walls not in shops, where the worker could be recognized as one who is making complaints, but in alcoves in the hallway.

The second source of information is intended for recording on-the-spot communication by the in-house telephone 05. On the day shift the information is received by a professional psychologist who has the necessary skills for conducting a conversation and analyzing the motives for the appeal, as well as the ability to give professional advice at once.

The third source, which takes into account the 24-hour operation of the association, is intended for recording information during the evening and night shifts with the help of an "automatic secretary," that is, a tape recorded with a recorded text and automatic switching on of the recording device. With the telephone lines it is assumed that the source of the information will be indicated. Thus the service for monitoring the mood takes into account the probability of both anonymous and open presentation of complaints.

There are three important aspects of the activity of the service: the accessibility of the application, the promptness of the response and the high results of the signal. Accessibility is provided by a combination of information channels, which makes it possible to register the signal immediately after a problem situation arises. In order to increase the efficiency of solving problems reported in the signals, by a joint decision of the directors and the party, trade union and Komsomol committees of the association, time periods which are shorter than those established by legislation have been set for considering questions, proposals, signals and

complaints from the workers. The sociologists are given only two days to make the information more precise, to analyze the situations and to fill out job forms, and the people who take action are given five days. Here one should take into account that the reaction should be immediate when the signals are especially important or have to do with a critical conflict.

Every day the sociologist or psychologist looks in the wall boxes in the corridors, receives telephone calls and listens to tape recordings. All the information is registered in a special journal and sorted according to the order in which it is to be considered. If it is necessary to clarify or obtain additional information, the sociologist goes around to those who have submitted the information -- the shop, brigade or section, or to one manager or another. After verifying the notification, the sociology laboratory sends the corresponding managers specially formulated job memos with the stamp "Good Mood Service."

The signals are used mainly at two levels of social regulation. The first and the predominant one is the so-called shop level, since the signals come most frequently from the shops. They are considered, depending on the situation, with the participation of the shop chief, the managers of public organizations, representatives of shop engineering services, foremen, brigade leaders and workers. For a detailed understanding of one problem situation or another on the scale of the subdivision, workers of the sociological laboratory have developed an express method of studying potential labor turnover.

The second level of social regulation is the association. It is involved when the signals require not only on-the-spot, but also long-range solutions, greater efforts and sometimes material expenditures. In this case the specific people performing the work are the managers of subdivisions, deputy general directors and head specialists. From time to time the "Good Mood Service," in conjunction with a representative of the association's management must also contact city management agencies.

During the three years of the functioning of the new sociopsychological service more than 700 applications have come in to the sociologists. Practical and operational decisions were made regarding 95 percent of them, and for the rest detailed answers, clarifications or advice were given. The efficiency factor of the mood service, as we can see, is fairly high.

The success of the operation of the service is determined largely by the fact that the main acting parties in it are the management agencies of the enterprise: the general director, the party committee, the trade union committee and other public organizations. The regular reports analyzing the effectiveness of the responses to social signals, which the sociology laboratory submits to managers of enterprises, serve to corroborate what has been said.

A large role in the recognition of the mood service has been played by channels of so-called resulting information. A permanent column has been established in the newspaper SHINNIK, for which the technical esthetics section has created an emblem -- a smiling sun with a telephone receiver and



the figures 05 on the dial. As a rule, the newspaper material is duplicated on the radio news programs. The initial document, which generalizes the work of the service, is the joint decision of the association's management, which is made on the basis of materials from permanent conference on questions of work with personnel. One must also include the public statements of sociologists and psychologists in the labor collectives, the lectures, and the various forms of training in sociopsychological methods of administration.

At weekly ideological conferences, in which executives of all subdivisions in conjunction with managers of party, trade union and Komsomol organizations participate, the sociological service analyzes the content of incoming signals, the practice of considering and resolving them, and the attitudes of managers toward social information and toward the appeals of the workers. In addition to this, the party committee has made the sociological laboratory responsible for a monthly analysis of the practice of work with social information at meetings of the party aktiv. Finally, a brief monthly report on the work of the service is sent to the reference information center of the party committee.

In the subject matter of the signals of the mood service we see a broad range of issues which can be joined together into 12 groups: organization of production and labor; calculation of wages and bonuses; sanitary-hygienic and off-duty conditions for labor; the functioning of urban and departmental transportation; the work of consumer services, trade and public catering; conflicts among people within the collective; medical service; suggestions for improving the sociopsychological climate; gratitude to the service for its assistance; and various other issues and advice. On the basis of conversations, sociologists have come to the conclusion that the main reason for turning to the service is the desire to improve the organization of production, labor and management. The service has permanent "signal senders," that is, active workers who are concerned about the affairs of the collective, about solving the most varied problems, and about eliminating mistakes.

More than half of all the communications come to the sociologists with some information about the author. Almost half of the signals are collective in nature. It is also very important that in 3 years there have been almost no signals with incorrect or slanderous content; all the communications are businesslike, benevolent or constructive in nature, even if they contain the severest criticism.

What practical results have we managed to achieve with the help of the mood service?

Much has been done to improve working conditions. One of the most important things has been the repair and renovation of the suction and exhaust ventilation systems in all of the technological shops. In order to carry out this complicated task, the enterprise created a special engineering staff headed by the general director. Following suggestions from workers in the preparation shop for large tire production, air conditioning was installed where the rubber is mixed, additional lighting was placed in the stairwells and on the paper pressing machine, and a box was equipped for storing instruments; in the administrative and off-duty building the air line was

insulated and fans were installed for drying hair; the off-duty rooms were renovated and clothes closets were replaced; in the inner tube shop a worker from the mechanics shop repaired the premises, made a window there, eliminated sources of noise and constructed a shop for welding work; in the first assembly shop they installed a new automatic soda water dispenser; and in the passageway to this production area they equipped an office for the guards.

A large amount of work has been done by the administration of the shop for control and measurement instruments and automatic equipment. The women of this shop asked that a separate place be assigned to smokers. In response to the collective signal, in the shop they not only fixed up a room for smoking, but also created a special nook for resting. At the request of the workers, in the hallways they installed automatic machines for selling tickets for the urban transportation, and a public telephone appeared in one of the hallways. After the electricians in the calender shop turned to the service, the shop administration accelerated the construction of an electricians' shop. The complaints of workers in the silica filler shop were taken care of immediately: the lighting of the working positions was improved, and the carry-over supply of special clothing and overalls was renewed.

The unsatisfactory organization of the issuance of special milk caused many complaints. The essence of the complaints was that the milk points did not manage to provide prompt service for the workers, they released the milk in exchange for overdue coupons, and as a result there was either not enough milk or, on the contrary, there was milk left over. After a detailed study of the situation the administration and the trade union committee made a decision to organize the issuance of special milk during the dinner break in all of the shop snack bars, and a date was to be placed on the coupon in order to ensure the observance of norms of providing it. As a result, there were no more complaints.

Quite a few signals were directed against public catering. In order to impose the proper order here, the consumer division developed a plan to renovate all the dining rooms, snack bars and food stores. Since a sector for technical esthetics was created on the initiative of sociologists at the enterprise, the dining rooms and snack bars were given original interiors with wood trim, murals, relief work and other decorations. The organization of public catering was also improved. In the dining room of the production section for small tires, for example, the line for complete meals was replaced with a line for ala carte selection, and in the summer they organized the sale of kvass and ice cream right in the production buildings. In response to numerous requests from workers, the consumer division arranged for mass procurement and sales of potatoes. Six hothouses were constructed for raising vegetables. The crops of cucumbers, tomatoes, fennel and parsley are being delivered both to the workers' dining rooms and to the children's preschool institutions. The creation of a public catering combine was an important measure. It has a banquet and ceremony room where they have family and collective festivities. There is a wedding in the plant practically every Wednesday. Responding to criticism from residents of the dormitories for small families, the consumer division opened a barber shop, a fashion shop, and a dry cleaning receiving point there, it expanded the assortment of products in the Shinnik store, and it organized the sale of meat products and the return of glass containers.

There have been many complaints about the poor operation of city transportation. What has been done? The association's administration, with the help of the city soviet of people's deputies, accelerated the opening of a new trolley route and changed the bus route. The trade union committee and the automotive transportation shop displayed initiative. Thus at the request of the residents of the microrayon of dormitories for small families, during the morning peak hours they have organized three trips to children's preschool institutions for parents with children. Departmental transportation has also been allotted for workers of the management shop who live in one of the suburban villages.

In order to improve the organization of production, labor and management (following a signal from one of the brigades of the second assembly shop of the large tire production concerning the lack of regularity in the organization of labor) economists and sociologists conducted time and motion studies of the work day and questioned workers, engineering and technical personnel and line managers. Then concrete practical recommendations were developed, whose implementation made it possible to bring order into the work of the tire assembly workers. They reacted similarly to a signal from the vulcanization shop of this same production. With the help of the "mood service" they improved the organization of the production practice of students of the base vocational and technical school, additional equipment was assigned to trainees, and they were given new lockers. After complaints from two workers the ring making unit and the assembly machine tool were repaired. Taking into account the wishes of the clients, the policy for filling out one-time passes was improved. The organization of work on the kolkhozes and sovkhoses that are supervised by the plant has become more orderly, and so forth.

Can one say that all of the measures listed above would not have been carried out were it not for the "Good Mood Service"? Probably not. The administration has always paid attention to the complaints and suggestions of the workers. But previously there was no center which could know about all the suggestions and requests, would take them into account, and, the main thing, would check on the responses. The existence of such a center changes things radically. Each worker gains confidence that he must be heard and that his request will not go unanswered.

We are convinced that the "Good Mood Service" is needed at the enterprise. Of course the future will show how it will develop subsequently, but even today one can draw a conclusion about its undoubted usefulness.

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## BOOKKEEPER RESPONDS TO EKO ARTICLE ON ECONOMIC MECHANISM

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 117-119

[Article by I. P. Naumov, head bookkeeper of the mechanics plant (Solnechnogorsk, Moscow Oblast): "At the Intersection of Three Interests"]

[Text] I support I. I. Usacheva in her assertion that the role of the head economist at the enterprise is extremely vague. I have had occasion to meet many people who hold this position.

At an enterprise in Gorkiy, where I also worked as a head bookkeeper, a former sovnarkhoz worker was appointed head economist. He was a good specialist in problems of supply, but he had no economic training. Many workers at the enterprise came to him with problems to be solved, but they had to settle for conversation: he was a great "diplomat," an intelligent, erudite individual. But he solved no problems; he only gave advice. At the enterprise they called him the "head persuader."

When in 1972 I transferred to the Solnechnogorsk plant, a former head engineer turned out to be the head economist here. He worked according to the principle: "don't bother us and we won't bother you." He almost never intervened in the activity of the economic services, and he did not even know what they were working on. The head economist was responsible for various secondary shop matters in the higher organizations and at related enterprises.

In my opinion, there are several reasons why head economists generally cannot justify their existence.

First, they have had no real authority to deal with credit or commodity-material values. Second, they have not even been responsible for planning indicators on the same level with the chiefs of the planning and economics divisions. Third, the higher organizations did not have on their staffs people who were responsible for guiding the activity of the head economists of the enterprises. I have been convinced of all this repeatedly, when conducting inspections of financial and economic activity at various enterprises.



The question of the job relations between the head economist and the head bookkeeper is not a simple one either. And it is not important what is "primary" and what is "secondary." The essence is that the bookkeeper is completely responsible for the financial and economic activity of the enterprise. At the same time he is responsible for the duties of the head state controller. And the head economist does not have such responsibilities. But if he had been given administrative authority and responsibility of the first personal party, it would be quite natural for the head bookkeeper to be under his jurisdiction. Then their relations would also be quite normal.

There are bookkeeping offices at all enterprises, from the very smallest to the giants. When the numbers of workers at enterprises increase, planning and economics divisions and divisions for labor and wages appear. At large enterprises there are also financial divisions which are engendered by the bookkeeping offices. There are also laboratories for economic analysis and scientific organization of labor. Incidentally, it seems to me that the latter are completely superfluous, and that their functions could be performed by the basic economics divisions.

Before the appearance of these divisions, all economic problems were solved by the bookkeeping office, even mechanization of economic work begins there. Hence follows the conclusion that the leading economic service of the enterprise, regardless of its size, should be the bookkeeping office. Yet because of subjective factors its prestige has dropped sharply and undeservedly, especially in the 1970's when the salaries of employees and engineering and technical personnel were revised. There also came to be a shortage of bookkeepers because they were no longer paid as much, and the chances that their salaries would be reduced were threatening.

As for the head bookkeepers, according to the chart for administration, they are not included among head specialists, but a level lower -- chiefs of shops and divisions. Yet the approval of an individual in the position of the head bookkeeper is in the realm of duties of the minister. It would seem that something is not quite right here: first, we are reducing the number of people who keep track of and preserve socialist property; they are paid less than engineer-economists are.

During the first years of Soviet power there was a mobilization of conscientious youth to work as financial inspectors (bookkeeping offices), and this was considered to be extremely necessary for the protection of state interests. The situation is different now, but there is still a need to protect socialist property and public funds. Bookkeepers now work at the intersection of three interests: of the state, of the enterprise collective, and personal. Because of the poor control at this intersection, we see, read and hear about inefficiency, pilfering and theft. And, of course, bookkeepers do not elicit positive feelings from those who are accustomed to sticking their hands in the state pockets: they impede, inspect and prohibit. A bookkeeper-controller is a "no person" and a "no" always elicits a negative reaction, especially among those who are striving for complete permissiveness.

Since ancient times the profession of the bookkeeper has been the profession of an honest and strong man. But today representatives of the stronger sex have all but disappeared here: 92 percent of the accounting workers are women, and 75 percent of the bookkeepers at enterprises and in organizations are also women.

I think that it is necessary to take effective measures to increase the authority and prestige of the bookkeeper. In addition to material and legal support, the bookkeepers need moral support, including through the press.

Bookkeepers are in the first line of defense of state funds and public wealth. And it is very bad when they do not have reliable rear support behind them.

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## NEW ORGANIZATIONAL FORMS FOR ECONOMIC SERVICE SUGGESTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 120-125

[Article by A. V. Sosnov, candidate of economic sciences, Gomel State University: "The Actual and the Necessary Ratio of Positions"]

[Text] Increasing the efficiency of the economic service is unthinkable without essential improvement of the forms of its organization, which was quite correctly noted in the article by I. I. Usavheva. Moreover, they must be improved not only at the level of the structural subdivisions of the economic services, to which the article was basically devoted, but also at the level of individual positions where, in our opinion, there are considerable reserves.

All the work performed in the economic services can be divided fairly precisely into creative and executive work. The first kind of work involves searching for and making use of reserves for developing production and increasing its effectiveness. In its nature it is similar to scientific research work.

Executive (current) activity contributes to maintaining the normal functioning of the processes and the realization of the results of preceding long-range activity. This includes the daily operational work, which is directed mainly toward providing the corresponding information regarding both internal needs and the needs of other subdivisions of the administrative staff and the higher agencies. Current activity is carried out according to certain rules, and in the future most of it will be completely automated and mechanized.

As research has shown, the basis of long-range activity is comprised of analytical-design and organizational-administrative operations, and current activity is based on informational-technical operations (see figure). Consequently, the former kind of activity is considerably higher than the latter in terms of qualifications that are needed.

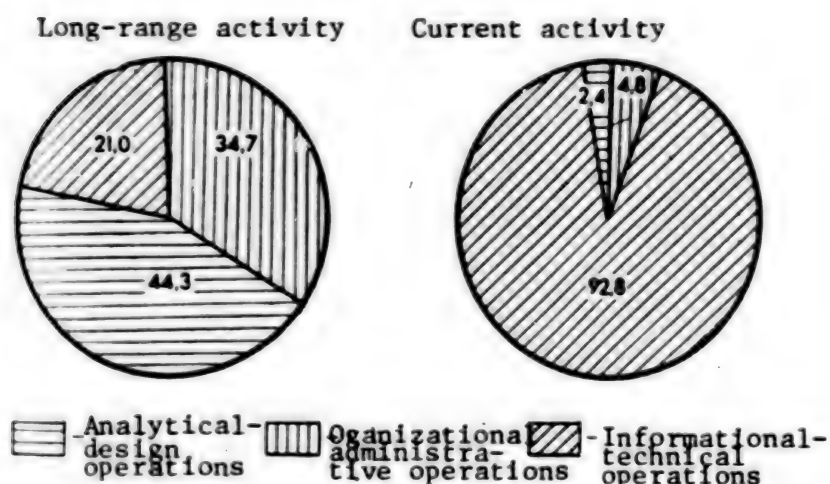


Figure. Structure of Kinds of Activity of Economic Services, % of Work Time

We conducted an investigation of the content and organization of the labor of almost 450 workers of services for technical and economic planning, and organization of labor and wages at 13 machine building enterprises of the Belorussian SSR. The investigation showed that on the whole the proportion of long-range activity is extremely small: it takes up 8-10 percent of the time. But it varies appreciably among the enterprises: from 1-2 percent to 14-15 percent. Its significance even varies considerably, depending on the job groups of the workers: from 15-18 percent among senior specialists (managers of subdivisions of economic services, senior engineers, senior economists, and so forth) to 8-9 percent among engineer-economists. Practically no long-range activity was found among technicians.

What should be the standard values of indicators for each job group? In order to obtain them, on the basis of an individual questionnaire we studied the distribution of time among workers of the corresponding services and selected the results of the best specialists in each job group (excluding technicians, since these positions do not exist in the economic services of half of the enterprises we investigated). An analysis of the structure of the working time of these specialists made it possible to establish the following values as standards: for senior specialists the proportion of long-range activity amounts to 44-48 percent, and for engineers -- 24-29 percent. Consequently, in each job group the standard values exceed the average values approximately 3-fold, and the standard for engineers is more than 1.6 times higher than the average value for the group of senior specialists. As for technicians, the standard value for them can be taken as the value for the group of workers with a secondary specialized education of an economic profile (see Table 1), that is, within the range of 10-15 percent.

Table 1. Job Structure of Economic Services, %

Job Groups	Sr. specialists	Engineers	Technicians
Proportion of all job	32	58.7	9.3

One is struck by the fact that the typical feature of the labor of workers of the economic services that were investigated is the small proportion of complicated jobs which require high qualifications, initiative and creative activity. At the same time, on the staff lists of subdivisions of economic services there is a prevalence of jobs for engineers and senior specialists (see Table 1).

Table 2. Qualifications Structure of Economic Services

Groups according to proportion of long-range activity, %	more than 29	15-29	up to 15	0
Proportion of all workers	5	14.9	51.9	28.2

On an average, for every technician's position there are six positions for engineers and more than three for senior specialists. There are no positions for technical executives at all in the services. But if one judges not from the titles of the positions but from the content of the work, the structure of personnel looks quite different (see Table 2).

There were actually four technicians and technical executives for every one engineer and senior specialist. This is precisely the ratio of specialists that is regarded as effective in all textbooks on scientific organization of labor. Consequently, in the economic services of the plants that were investigated the titles of the positions do not correspond to the content of the labor. They are raised by at least one level over the qualifications level of the people performing the duties.

Such a lack of correspondence between the qualifications structure of the activity of the services and the composition of the jobs makes it possible to fill engineering positions with practical workers or individuals who do not have specialized education in the profile of the job. According to our data, in the economic services almost 30 percent of the workers are not employed in their specialties, and more than 10 percent do not have a specialized education at all.

Among the main reasons for this situation, in our opinion, one can include shortcomings in the payment for the labor of specialists. The amount of a worker's salary is determined by the title of his position, and not by the



content or the results of his labor. The prolonged stability of salaries for engineering and technical personnel and the steady growth of wages of workers violate the objectively necessary ratios of the levels of payment for their labor. Therefore at the enterprises they have found a solution: the salaries of engineering and technical personnel are increased as a result of raising the titles of their positions. This is promoted to a certain degree also by the existing policy of annually reducing expenditures on maintaining management and administrative personnel, and the elimination of the lower paid positions which is related to this. To this end the enterprises strive to create a complex structure of management with a multitude of positions for managers of various ranks.

The right that has been granted to the enterprises to regulate the salaries within the limits of the "forks" and to introduce personal increments is limited by the narrow range of these "forks" and the requirement to implement all measures within the limits of an established wage fund. If one then also takes into account the lack of sufficiently objective criteria and methods of evaluating the activity of the worker, and also the lack of a direct link between the results of the evaluation and the amount of the salary, it becomes understandable that neither the salary itself nor the extremely problematical prospects of increasing it can create the necessary stimuli.

The system for awarding bonuses to workers of economic services does not operate any better. Bonuses are usually paid from the material incentive fund according to the overall results of the work of the collective, with practically no connection with the results of the individual activity of the workers. Only for some very serious omission can the worker be deprived of this bonus, or the amount of it can be decreased. Bonuses are calculated in percentages of the salary, which is why they are regarded as a simple additional wage. Bonuses from special funds (for the introduction of new technical equipment, reductions of labor-intensiveness, exported products and so forth) have no stimulating effect either, especially on the rank-and-file workers. The lack of publicity and the secrecy during their distribution and the inadequately substantiated determination of those who are to receive bonuses as well as the amounts of the payments also lead to a situation where these bonuses are received mainly by managers of subdivisions of economic services. On the one hand this might be fair, since it is usually these people who make the greatest contribution to the achievement of the result that earned the bonus. But, on the other hand, the rest of the workers do not have a permanent incentive to improve their activity.

The lack of a statewide system for regulating organizational-economic creativity also essentially reduces the possibilities of moral and material stimulation of the long-range activity of economic (and not only economic) services. This issue has already been raised on the pages of the magazine (see EKO, 1977, Nos 1,3,6), but it has not been resolved so far.

In addition to the shortcomings in the stimulation of labor there are others which have contributed to the state of affairs that exists in the economic services. They include, for example:

the low level of mechanization and automation of engineering-management labor;

the lack of the necessary clarity in the organization of long-term activity, which is largely related to the incompleteness and lack of a system when solving organizational-economic problems related to developing production and increasing its effectiveness.

It is quite natural that the worker's specialization, his level of qualifications and the needs of production determine the specific set of his job duties. But in any case the basis of these should be the practical realization in production of the achievements of modern science and practice. In our opinion, only this kind of activity of the specialist is productive in nature. Any other kind of activity is auxiliary and secondary. And their volumes must be reduced in all ways within reasonable limits by transferring them to the "shoulders" of machines.

The need for this kind of approach is confirmed by the results of the questionnaire of specialists of economic services. An analysis of the opinions of the workers showed that the actual content of their labor does not satisfy them, it equalizes the demands made on workers with various levels of qualifications, and it makes it impossible to fully realize their qualifications potential. Hence the dissatisfaction of a considerable number of specialists with their work, the weak motivation to increase qualifications, the passivity and the irresponsibility. The prestige and attractiveness of work in economic services are declining. Thus the workers who are most satisfied with their work are those with a secondary specialized education in an economic profile, who hold engineering positions. They are pleased by everything: duties, wage level, and conditions and organization of labor. The least satisfied of all are specialists with a higher economic education, who also hold positions of engineers.

The questionnaire of graduates of the economics department of Gomel State showed that the majority of young specialists, once they have become familiar with their future work in production practice, have an extremely negative attitude toward the prospect of working in traditional positions in economic services. They all give different reasons, but one prevails: "Monotonous office work, which does not require a higher or even a specialized education!"

Practice provides many examples of truly creative activity on the part of economists. This is shown, in particular, by the content of the labor of standard groups of specialists. But their labor and its results are based mainly on enthusiasm, initiative, conscientiousness and other human qualities. These should also be reinforced by the organization and stimulation of labor.

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## EDUCATION OF ECONOMISTS IN VUZES DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 126-130

[Article by L. A. Konovalov, doctor of economic sciences, professor, chairman of department of economics and organization of ferrous metallurgy enterprises of the Ural Polytechnical Institute imeni S. M. Kirov, and A. V. Grebenkin, candidate of economic sciences, Institute of the National Economy (Sverdlovsk): "Formation of the Economist's Creative Potential in the VUZ"]

[Text] I. I. Usacheva's article contains a reproach against young specialists whose appearance in production does not lead, in her opinion, to an increase in the creative potential of the economic service. We shall try to express our view of the complex of factors that bring about this dissatisfaction. Let us consider three cross sections of the problem:

What demands does economic practice place on the young economist?

How and in what conditions does the economics VUZ (department) train specialists?

What are the real interrelations between the VUZ and the enterprises in the process of training specialists?

If one compares the work of the economist with the activity of a designer or a technologist, one quickly notes that the creative element occupies a much smaller proportion in the work of the first. Planning and economic activity, as distinct from engineering activity, has turned out to be strictly regulated by centrally established indicators and forms.

Yet the need to increase the creative component in the work of plant economists is conditioned at least by the following circumstances.

First, the realization of the party course toward mainly the intensive path of development requires the ability on the part of managers and specialists, mainly of the economic service, to develop and realize this strategy. Economists play a larger role in conducting comprehensive research on existing technology and developing ways of improving product quality and raising the technical level of production. Economists should play the leading role in

conducting a functional-cost analysis, constructing a system of goals for socio-economic development, and evaluating the variants of scientific and technical decisions. The need to expand the role of economic science and practice in increasing the effectiveness of production was noted in the decree of the June (1983) Plenum of the CPSU Central Committee.

Second, high-quality functioning of the entire intraproduction economic mechanism is also a matter for the hands of the plant economic service. Third, a mass increase in the economic qualifications of all workers of the enterprise requires that the economist perform new functions -- those of the instructor, the methodologist and the propagandist.

But it is not just the everyday economic work of the enterprise that influences the young specialist with an economic profile. In keeping with the instruction of the USSR Ministry of Higher and Specialized Secondary Education, in many economic VUZes and departments students are working on the creation of training-scientific-production complexes (UNPK), which join into a unified system the VUZ, the scientific research institute and the enterprise under the aegis of the departments that produces economists. The success of such an undertaking is promoted most of all by the existence in the same city of a large plant and a specialized economics institute of the same branch. Without this condition the creation of a UNPK is extremely problematic, and the lack of a scientific research institute of an economic profile as part of it makes it logically impossible to complete the process of the formation of the complex. Thus the most delimited and successful has been the cooperation within the framework of the UNPK between the department of economics of machine building and the organization of enterprises of the engineering and economics department of the Ural Polytechnical Institute imeni S. M. Kirov, on the one hand, and, on the other, the "plant of plants" -- Uralmash and the scientific research institute of economics and planning of the USSR Ministry of Heavy Machine Building, which is also located in Sverdlovsk. Students selectively become familiar both with fragments of scientific and economic research and with the search for intraproduction reserves under the conditions of a powerful machine building complex.

With all the positive that can be noted concerning the undertaking, it is still difficult for it to make a way for itself. Why? The reason is the voluntary public nature of the UNPK and the orientation toward personal contacts during its creation and functioning. If the VUZ manages to allot from its modest funds money for hourly payment of specialists of the scientific research institute and the enterprise, the matter proceeds, and if not, it is difficult to expect active performance of workers of the enterprise and the scientific research institute in the UNPK, which has neither organizational-administrative nor financial support.

Either within the framework of the UNPK or outside it, a correct orientation of the VUZ toward the development of the creative potential of the economics specialist is impeded, paradoxical as it may be, by the peculiarities of the existing intraplant system of training-methodological and scientific work. The functional specialization of economic disciplines has led to a breaking away of general economics departments (statistics, analysis, production management) from production economics -- economics of machine building,



economics of ferrous metallurgy and so forth. General economics departments are not responsible for the creative potential of the economist nor are they linked to a specific branch of production. The situation is even worse with respect to general theoretical disciplines. Thus the economist needs a profound knowledge of quite distinct sections of higher mathematics. But the programs envision the study mainly of those sections (for example, differential equations) whose economic application even for research purposes is extremely problematical.

Further. In order to produce "tomorrow's" specialists for a specific branch of industry, the instructor of a special economic discipline must have in his hands branch methodological materials regarding organizational and economic innovations. This seems axiomatic. But it would be wrong to think that the head branch scientific research institute or planning-economics administration of the ministry for which the given VUZ trains specialists will include in the list of references to these materials in the first issue an indication of the departments that are producing them. The "Cinderella" is not only the economic service of the enterprise (see cover of EKO, 1983, No 1), but also the department of the VUZ which forms the creative baggage of the economist.

Almost half of the scholars (or, rather, people with scholarly degrees) are concentrated in the VUZes of the country. The press periodically calls for activization of the utilization of this colossal scholarly potential through introducing the results of scientific research work and obtaining a real economic effect. In the struggle for this, in some places they forget about two important circumstances: 1) the main effect from the work of the VUZ is manifested in the sphere of the utilization of the specialists they train; this is not an immediate effect (for bonuses), but a delayed one, and it is not easy to measure it, but in principle it is possible; 2) the realization of many scientific and economic developments (methodological points, methods of analysis, new indicators) does not produce an economic effect in the form of an immediate reduction of the norms for the expenditure of resources or an increase in profit, but serves only as one of the organizational and economic conditions for future increased effectiveness of production.

Does the VUZ need to artificially divide training-methodological and scientific work into two spheres? For the VUZ is concerned about only one thing -- the future specialist. In our opinion, instead of purely functional departments they need departments for object-specialization (within reasonable limits). The department is the basic unit of the VUZ which conducts training and scientific work. But try to draw up and implement a comprehensive scientific and economic program which includes various departments! It is like putting cats and dogs together. But, as experience shows, it is considerably easier to solve these problems in a combined department. All training and methodological documents and plans for state budget and economic contract research of instructors even in other departments of the VUZ (not only the economics department) who participate in the training of economists of a given specialty, should be formulated and approved in the head department for these students -- the one that graduates them. This is the only way to avoid the situation in which, say, for planning industry the future specialists are presented with mathematical planning methods using examples from agriculture. The economic effect should be calculated primarily as the

result of that creative contribution which the graduates make to production. If they do not have a creative streak -- there is no contribution. If they do not appear at the plants where they are assigned and have found a soft job as a merchant -- this is a failure in educational work. Only permanent contacts with graduates, their retraining, and consultative contacts with enterprises which involve them constitute a viable basis for success of the VUZ department in forming the creative potential of the economic services of the enterprises.

Finally, the third cross section of the problem that has been raised: the interrelations between the VUZ and the enterprise in the process of training economists. One must admit that these interrelations are largely formal in nature, being limited to the need for the students to undergo production and pre-diploma practice and the utilization of plant materials in course and diploma projects. An immense reserve lies hidden here. Even in this stage the economic service should actively assist in the development of the specialist, right down to the point of discussing and refining the list of developments of organizational and economic questions needed by the enterprise, not only in the immediate future, but also over the longer range. These questions are the subjects of future course and diploma projects.

One cannot permit a situation in which the student roams around the enterprise with nothing to do because the manager assigned to him is busy with current affairs and gives him at best an hour or two a week. The best variant is to stipulate mandatory paid staff work for the student during the time when he is doing his practice work as an apprentice economist. This will give him discipline, will contribute to drawing him in to the labor collective, and force him to perform real functions and search for a place to apply his unspent energy. If on a statewide level it is impossible to solve the problem of deducting the wages for specialists from the enterprises, it would be quite possible to stipulate officially in the estimates of expenditures the incomparably smaller expenditures on the practical work done by students.

The matter would proceed more successfully if, along with joint training of specialists, the VUZ, on an assignment from the enterprise, would conduct scientific economic work -- either under an economic contract or on a public basis. Moreover, consultative assistance to the economic service on the part of the VUZ, constant control over the work of the graduates, and jointly conducted economic experiments, seminars and conferences with the mandatory participation of students, joint publications, assistance in increasing qualifications, right down to the preparation and defense of dissertations by plant economists -- these are only some of the concrete measures for improving the interrelations among the economic VUZ, faculty or department, and the economic service of the enterprise in order to increase its creative potential.

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## PRICE LIST SEEN AS SIGNIFICANT IN PRODUCTION ECONOMY, INTENSIFICATION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 131-144

[Article by V. G. Ramm, candidate of technical sciences, GIPRONIIPoligraf branch (Leningrad): "A Barrier or an Accelerator?"]

[Text] "The price list is for appearances ..." -- A. S. Pushkin, "Eugene Onegin".

Tell me, dear reader, when the conversation turns to economizing on resources and intensifying, what importance do you place on the price list? Understandably, not primary importance, but perhaps it is not last in importance either? Unfortunately, the majority of us do not think about it at all.

And this is too bad.

The price regulates the relations between the buyer and the seller, between those who consume services and those who render them. At first glance it seems that it should affect mainly the consumer: one might think that he will select goods and services considering his own financial capabilities and the price list. And the seller (performer of services) will sell what is asked for or do what is ordered.

No, respected reader, this is not only an ideal but frequently simply an incorrect picture. If a high heel has broken off from your shoe, you do not order a low heel because it is cheaper. You pay what you have to pay. As a rule, you do not even look at the price list that is hanging right there. And the enterprise sends its products from Leningrad to Vladivostok, which is stipulated by the contract, and not to Tikhvin, which is cheaper; it is not worthwhile to purchase the less expensive slotting machine instead of the vertical lathe which is needed ...

When two goods of the same type are competing on the counter, but they differ in price and (possibly!) also in quality, you begin to think ... But competition is not our style of management. The majority of our services are rendered by specialized organizations. This makes it possible to plan and

expend thriftily the resources that are used for producing goods and rendering services. This makes it possible, but it is certainly not a guarantee of thriftiness.

The price list is like the notes played by the person who renders services, but it is certainly not for you, comrade consumer, even though it may seem to you that you have "ordered the music." It is not for you, but mainly for himself.

If, for instance, you are the head bookkeeper of the enterprise, this is no problem for you. Include the expenditures on transportation and communications services rendered to the enterprise along with those for the materials and batching items that are delivered in the production cost, and then include them in the price of the products you produce. When the net output is calculated these figures will generally be "included in parentheses).

But for the supplier of the goods and services the price list is something like a catechism. For him, each service rendered and each unit of products sold is a step toward fulfillment (and overfulfillment) of the plan, and subsequently -- toward the bonus and the honor roll.

"Well, so what?" -- you ask. "We consumers still form the production program for the suppliers, their plan is formulated from our orders, and therefore we and not they are in charge of the situation."

Is this really what you think? And tell me, has it never happened to you that, when ordering a railroad car or container for shipping cargo you have had to invent extra tons, and when ordering a truck for the same purpose you have had to invent both tons and kilometers so that they would accept the order? And when you get into a taxi does the driver not tell you that he does not go where you want to go? And when you want to acquire an item that is less expensive, do they not tell you that the only ones left are ... more expensive? Finally, think about why the tea always runs out quickly in the pastry and snack shops, while there is always coffee left. Immense quantities of tea are grown in our country, and we have to import coffee from Africa and Latin America for currency.

Do you agree, comrade consumer, that the supplier (salesman) is more important than we are? But he is not the most important person. The real master is the price list, which causes him to expend a deficit (or even just limited) resource in one way or another, dictates the structure of the plan, and tells him which client to serve and which to tell: "I'd be glad to, but I can't."

Let us look at why this takes place, and perhaps we shall see how to "restrain" the price list, for in the end we are people (both consumers and suppliers), and it is only a systematized collection...

Is Defective Work Really Advantageous?



By various methods the price list can not simply impede economizing on resources, but in some cases can directly turn good deficit raw material into wastes. And even if there are hanging in the shops convincing posters about economy, which is included among the most important indicators of competition, and even if conferences devoted to it are held weekly. Both raw material and labor continue to be squandered!

Can wastes be more costly than good raw material? Of course they can, when rare-earth elements are discarded during the enrichment of ores. Here we simply do not notice what we are losing. But is it ever advantageous, having received good raw material, to spoil it deliberately, to turn it into garbage, into defective material? It turns out that sometimes even defective material in this case has a golden lining!

I was sitting in the printing office studying the documents concerning the delivery of paper. The documents were shown to me after I made a solemn oath that I was not from the OBKhSS [Department for combating the embezzlement of socialist property and speculation] or the people's control office. Therefore I do not wish to be specific about the location. Incidentally, everything was in order with the documents: all the signatures were there and there were no forgeries. One can find documents like these in any printing office. Although, of course, each of them reflects an exceptional case. For example, this: "Five rolls of paper arrived from the customer. The wastes amounted to 41 percent of the overall volume, or 701 kilograms."

Only the suitable part of the roll of paper goes for filling the order, and that which is wet, wrinkled, torn or split is rejected as defective.

You probably know that if a roll of paper is left out in the rain, it becomes wet; if it is caught on an iron hook it is ripped; and if it is dropped from a high place -- it splits ... Does it seem to you that 41 percent is too high a figure for wastes? Wait a minute before you become upset. This rejected material along with parts that are cut off (production wastes) can be sent for scrap paper, but they can also be used. And here is where the most interesting thing begins. Since the printing office uses the customer's raw material, they tell him: "There was not enough paper for your order; ship some more. You can take these wastes (it would be interesting to find out why the client would want them) or you can sell them to us -- we will take them at a fair price and use them for something." The printing office purchases the damaged paper, but now it no longer belongs to somebody else, but is its own. And one can do whatever one wishes with one's own paper.

Imagine that you are the director of a printing office. In the first place, from this paper you can make those very forms for the same client. It makes no difference that the paper is split. Cut it with a hacksaw, the sheet machine will trim it to the right size. Take a look, and you have saved quite a bit of good roll paper.

In the second place, with your own paper you can fill orders from organizations that do not have their own supplies of paper. For example, you have printed something for a machine shop or simply given its director a

couple of kilograms of good (say, Finnish) paper, cut into sheets, and for this the shop repairs for the printing establishment a machine (printing, linotype, electronic engraving equipment, or even your own private automobile). It is advantageous since the printing office has neither spare parts nor materials nor equipment for repair, nor repair workers with the necessary qualifications. And it is repaired quickly and almost free of charge -- for, after all, you satisfy their needs quickly and almost free of charge. You print something for the director of a movie theater (a congratulatory address for an honored veteran or invitations) and you receive free passes for the best seats in the house, without waiting in line, and on the day of the opening ...

Do you have a sense of how nice it is when there are a lot of wastes? But this is still not all. These are only the "small stratagems," concealed, hidden joys, which should not be discussed from the tribune, and it is not acceptable to write to the newspaper about them as "advanced experience." It is an ordinary exchange of services (true, at state expense).

But you need glory, and you want to be a leading worker!

There will also be glory: there is also a third way of utilizing wastes.

And so, in the third place, from these wastes one can produce goods for cultural and domestic purposes, the so-called "kul'tbyt," for which, incidentally, you have a plan. It would be interesting to find out how an enterprise can introduce waste-free technology when it has a concrete plan (with a products list) for producing products from wastes. Of course you overfulfill this plan in physical terms. And it is remarkable: the children receive more paper toys, small books with pictures, board games and calendars, and the adults receive more "note paper," and so forth.

But something else is more important: you will make a decisive contribution to the fulfillment of the plan in terms of gross output and profit. The fact is that price lists (for wastes and also for prepared products made of good paper and "kul'tbyt" made of wastes) are such that the utilization of wastes for producing products is considerably more profitable than manufacturing the necessary products from the initial good raw material.

Everyone calls upon the director to economize on paper which is in short supply. There is not enough of it for books and it must be shipped in over thousands of kilometers, and frequently it must be paid for in foreign currency. But the price list urges him to use more good raw material as wastes or simply to transform it into wastes. What happens to a person who is called in one direction and pushed in another? He will fall while struggling, or go where he is being pushed, but he will never go where he is being called.

The problem is not so confusing as it seems at first glance. The law of conservation of matter is in effect: the paper does not disappear and it does not appear from nowhere. There is an overall flow of paper which is divided into three parts: one part goes for the basic product, another for the products manufactured from wastes, and the third -- for scrap paper. Each

part has its own profitability. And the person who controls the distribution of the resource will control the overall flow in such a way that the total profitability is maximal. And as for objective conditions, strict control and so forth -- all that is there: there are clear-cut norms approved by the USSR Goskomizdat [State Committee for Publishing Houses, Printing Plants and the Book Trade] for the expenditure of paper for the technical needs of production and the instructions, "On the Classification and Utilization of Wastes of Printing Paper Formed in the Process of Printing Production." According to these documents, the total permissible proportion of wastes because of ripping and smashing of the rolls is about 2.2 percent. Everything is there, but still it is known that if it is necessary to get a roll wet it will be soaked, and if it must be crumpled, it will be crumpled. Everything is in our hands. I assure you that if it were necessary to pay considerably more for scrap paper, the technology would adapt so that more than half of the scraps would be used as high-quality paper.

There are possibilities of changing the price list in such a way that economizing on raw material and taking a thrifty attitude toward it would be advantageous for everyone in any stage of production. The possibilities would be increased significantly by an orientation toward the normative net output. It is only necessary to take advantage of them, to make both ends meet, and to "push" the manager in the same direction as we are calling him.

#### Every Day -- A New Life

As distinct from raw material, means of labor are utilized repeatedly, if again the price list does not impede this. The price list frequently causes us to destroy that which we could utilize for repeated production. No, not the machine tools and equipment themselves, but the fittings, adaptors and so forth. This sounds incorrect, but let us return again to the printing office. More than 90 percent of the products on the list which are being produced by the rayon printing office this year were also produced last year, and the picture will not change next year: the same blank forms approved by the USSR Central Statistical Administration, the same report forms approved by the USSR Ministry of Finance, and the same labels for enterprises that produce mass products.

The typesetting and form making processes serve to create means of labor, and these means -- forms installed on the printing machine -- provide for the output of products, that is the printing process. "But this is trivial!" -- you will say, and you will be right.

But the price list demands that you forget about "the specifically characteristic feature of human labor" (as K. Marx in Volume I of "Das Kapital" called the creation and utilization of means of labor) and destroy means of labor (printing forms or stereotypes) after filling the next order. The fact is that the price list "Wholesale prices for printing products" does not envision for the client the possibility of repeated printing of blank forms from printing forms that have already been made. They can only take place together -- typesetting and printing. The printing office (if one obeys the price list) operates as though it begins a new life every day, having

forgotten completely about the past and having no idea of the future. Once the next typesetting and creation of a new form for repeated output of blank forms is paid for (which is mandatory), it is assumed that this typesetting will be done and this form must be manufactured. Otherwise this is not work but "shpek," as the printers say, or simply forgery. In order for there to be no forgery, deception or write-ups, the old typesetting form must be destroyed after its first use.

It is precisely the price list that serves as a barrier on the path to the introduction of technological processes that save on labor, materials, finances and equipment. A change in the structure of the price list removes this barrier and contributes to a rapid intensification of production.

**Forget About Savings -- And You are Assured a Bonus!**

The production of products should be profitable -- this is axiomatic. This means that the price (on the price list) should be higher than the production cost -- another tautology. Of course it must, or else we would have not profit, but losses. But are we not approaching the aforementioned axiom about profitability in too vulgar a way? We have become accustomed to the notion that profit should be proportional to the established norm for profitability, and somehow we do not notice that it is also proportional to the production cost, that is, the expenditures. No, of course, we say: "Proportional to production volumes ..." But we have in mind precisely expenditures: the greater the expenditures, the more the profit!

And if we approach it from the other end? What results is: if you want more profit -- do not spare expenditures!? This would make common sense if by increasing expenditures we rendered more services, introduced more facilities or shipped more cargo. But what if we do the same amount, but our plan (and profit) are determined only by the volume of expended funds, used fuel and so forth? Then everything is not so smooth.

Then the transportation organizations will refuse to introduce systems that optimize shipments: the shipments are fulfilled, but not the plan. By the same token, the director of an enterprise resists economical, thrifty technology, and it has to be "introduced" by force. Having introduced the new technology, the enterprise will expend less metal, paper, energy and labor, and this means that he will receive fewer of these products from the client, and his profit will drop -- and then the plan will be threatened. Not to mention that he can say goodbye to the bonus, first place and so forth.

The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Improving Planning and Stepping Up the Influence of the Economic Mechanism on Increasing Production Efficiency and Improving Product Quality," points out the way to overcoming this inconsistency: "retain throughout the course of the five-year plan stable wholesale prices in industry, estimated prices in capital construction and rates for shipping cargoes." That is, the additional profit obtained as a result of reducing outlays goes to the manufacturer of the product!



Let us think about whether it is possible, by moving along this path, to create an economic mechanism which will motivate the enterprise that renders services to reduce its own expenditures or, simply speaking, is it not possible to arrange things so that the transportation workers will try to save on cars, energy and fuel, and will strive to "expend" as few ton-kilometers as possible to fulfill contractual commitments?

It is possible. In the majority of cases the price list now reflects expenditures very carefully and scrupulously, but the decree suggests actually utilizing a cruder mechanism -- firm prices for the entire five-year plan. This is the entire matter. Let us make the price list cruder, such as, for example, in the telegraph: 5 kopecks earnest money + 10 kopecks for delivery. It is not important which earnest money or where the delivery goes to.

It is not only that such a price list simplifies accounts. It breaks down that proportional dependency between expenditures and profit which impedes economy. Income will no longer depend on the method of performance of the work. When sending telegrams you code frequently encountered words (for example, "entire") or entire expressions ("Happy New Year!"), you condense information and send it to one address by a light or laser beam, or via satellite. That is, by any methods you reduce expenditures on the transmission, but the income (according to the price list) remains the same. And the method of delivery (for instance, the postman brings several telegrams to one building at the same time and not one at a time) does not influence the income either. And as soon as the income does not depend on actual expenditures, this means that the profit from saving on them does not decrease, but increases! That is, a crude price list motivates directly (personally) the supplier of the services to reduce outlays and to economize in all ways on all resources. And the mechanism of personal motivation awakens initiative and enterprisingness much more rapidly than does the mechanism which causes the individual to work "out of fear" or "out of conscience," from a fear of punishment or a sense of responsibility.

If the motives of "fear" or "conscience" contradict personal motivation, one can always find objective causes: the paper got wet because it rained and the roof was leaking; they did not move the paper to a dry corner because it was filled with barrels; the barrels were not rolled away because the loader had gone to the doctor; the person did not do the loader's job himself because he had come to work in a clean suit ... Reasons will be found.

How does one make the price list cruder? Very simply: stop paying attention to details. We do not count the number of letters when transmitting words on the telegraph, but use averaged norms and rates. Let us try to approach other services from this position. It is especially interesting to consider services for which there is a flexible demand, that is the rates do not influence the structure of the demand, but only the strategy and tactics of the supplier of the services. First of all this includes the needs of the enterprises for services of the production infrastructure: the quantity and list of them are determined by the production program of the enterprise and its contracts, and not by the price list for them.

Let us discuss transportation services. Yes, ton-kilometers. We have many people writing about the problems and collisions related to the utilization of this indicator, and all of them call for changing it as quickly as possible. Moreover, the CPSU Central Committee and the USSR Council of Ministers have adopted a decree, "On Improving the Planning and Organization of Transportation of National Economic Cargo and Passengers and Stepping Up the Influence of the Economic Mechanism on Increasing the Efficiency of the Operation of Transportation Enterprises and Organizations," in which it is suggested that the overall volume of shipments (dispatches) of national economic cargo be planned in tons.

The services of the transportation enterprise are subdivided into basic (the "work" itself -- shipping cargo over a distance, which should also be measured in units of work, i.e. in ton-kilometers) and additional. The latter work can be measured only in rubles -- it includes loading and unloading, payment for idle time, additional payments for rush work, and so forth. Let us look at whether or not it is possible to restructure the price list in such a way that, on the one hand, with "fixed" services (ton-kilometers) the dependency of payments on the expenditures of the expenditures of the transportation workers will be as crude as possible, and, on the other, the price list can take additional services into account. Let us try to introduce "quantification" individually for kilometers and for tons.

The price list (rates) can be made "cruder" in terms of kilometers, say, by ordinary "regionalization" of shipments: within the rayon or city; to neighboring (adjacent) rayons; within the oblast; to adjacent oblasts; within the region which includes several oblasts; to neighboring (adjacent) regions of the country; within the country (possibly, also within a group of regions -- for we have a very large country); and abroad (and here it is possible to use similar "regionalization").

For the eight categories of distance it is expedient to introduce their own rate which depends on the averaged (according to demand) evaluation for the distance. It would be no great crime to err a little here, when evaluating the demand (according to distance): for in the state budget the profit of the transportation workers comes up against the profit of the client, and therefore nothing terrible would happen if our distribution of it between the supplier and the customer were not quite precise. The main thing is to realize the "axiom of profitability" of the overall (total) volume of shipments. And this, you will agree, is a much less rigid requirement than the profitability of each individual shipment.

With this organization of the price list it is advantageous for the transportation enterprise to take the shortest route and to reduce deadhead trips, that is, to route the shipments in such a way as to have an optimal combination of several paid trips into one route, and so forth. For the client's payment for the work of the transportation workers will not change, but expenditures will decrease, and profit, and along with it the material incentive fund, will increase!

"Nothing will come of it! No 'regionalization' will help," the skeptic reasonably objects. "With this kind of system the transportation workers will try to avoid long-distance shipments within a single rayon, and the situation will be even worse!" No, it will not be worse: if with precise accounting the transportation worker is motivated to waste resources (most frequently they call it "assimilation"), with "regionalization" he will be motivated to economize on them.

Quantification according to weight (volume) is not difficult either. Incidentally, since cargoes of varying density are shipped -- from heavy iron to light down -- accounting in terms of weight alone does not sufficiently characterize the need for transportation. Every means of transportation has limitations in terms of volume and weight capacities, and the correlation between them is not good enough. Usually, the greater the space capacity, the greater the weight capacity as well. So means of transportation can be arranged in a series according to these characteristics, and, by indicating for each cargo the most suitable means (truck or railroad car), one can find out which proportion is required by the cargo that is being dispatched. Then the weight of the cargo is known, and it is not necessary to measure the volume precisely, "down to the liter." If it will fit in terms of all three measurements, the "volume" can be taken as the product of them.

And further, it is not mandatory to indicate the rate in proportion to the mass or volume; it is sufficient to introduce a gradation: up to half of the capabilities of the truck (car) -- one rate; more than half -- another rate. Of course it is also possible to use smaller levels, as long as one does not strive for proportionality! With this approach to the price list, it turns out that the small load is most advantageous for the transportation worker. Indeed, with the same payment it is possible to utilize better the weight and volume capacities of the means of transportation. Instead of shipping 20 individual cargoes on 20 small cars, as is envisioned when filling out 20 separate orders, the transportation enterprise can place them in one large truck and ship them all at the same time, saving a large quantity of fuel and labor. Since the payment does not depend on the method of shipment (the main thing is to deliver the cargo), the savings on expenditures automatically increases the profit of the enterprise. I repeat that an important condition is the lack of proportionality: two "small" cargoes should cost the client more than one "large" one, that is, breaking down shipments is not advantageous for the shipper, but it is for the transportation enterprise.

"But then, ? you say, "the shipper will try to group cargoes into large batches, in order to utilize 100 percent of the cargo and weight capacities." Precisely! Let them try, and this will reduce the need for transportation (while improving its utilization), which is advantageous to the state. "But then the transportation workers will strive to ship mainly small cargoes! And this probably goes against the interests of the state?" Not at all. When it is necessary to deliver a miniature instrument, the state only loses if we merely give the appearance that it weights 60 tons and takes up a commercial railroad car ...

You will agree that the price list is not so terrible as it appears at first glance. And the main thing is that it can be not only "restrained," but also "trained," changed from an enemy into a friend. We are quite capable of forcing, or, rather, persuading the price list to serve the goals of intensification, economy and effectiveness.

It is perhaps not a matter of how it appears concretely, in what units the total (gross) indicators of the plan is measured, but of that ladder which leads to the indicator. On each rung the price list should push the worker (enterprise) that is performing services in the same direction as he is being called by fear or conscience: toward economizing on energy and material and labor resources, thriftiness, assiduity and enterprisingness.

At least three conditions are mandatory for this:

on the price list the profit does not increase, but decreases as the production cost of the given service increases;

the price list "rejoices in the caprices" of the client;

it envisions the responsibility of the performer of the services for the promises he makes.

When these conditions are met the price list changes from a brake on intensification, a barrier on the path to extensive introduction of technologies that economize, some kind of "evil spirit" which draws us to extravagance, into an attentive and zealous proponent of economy. It becomes a real catalyst for intensification. In the end it is all powerful, but not ill-intentioned ...

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## VIETNAMESE NATIONAL ECONOMY RESTORED AFTER WAR

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 145-155

[Article by Ya. N. Pivovarov, candidate of economic sciences, Institute of Economics of the World Socialist System of the USSR Academy of Sciences, and M. P. Isayev, candidate of historical sciences, adviser of the USSR Ministry of Foreign Affairs (Moscow): "Vietnam at New Landmarks in Socialist Construction"]

[Text] Since the time of the state reunification of the SRV in 1976, the Vietnamese people have been working hard to restore and develop the branches of the national economy and create a unified socio-economic structure. At the cost of immense efforts and also because of the all-around assistance from the Soviet Union and other CEMA countries, during the 2nd Five-Year Plan (1976-1980) the state invested significant amounts of money for economic development. As a result, fixed capital increased by 91 percent during this time. In 1980 about 60 percent of the gross social product and more than 40 percent of the national income were produced in the socialist sector. The proportion of group A increased to 40 percent. The output of electric energy increased during the five-year plan from 2.6 billion to 3.6 billion kilowatt-hours, the extraction of coal -- from 5.2 million to 5.3 million tons, the production of cement -- from 636,000 to 641,000 tons, and the production of fabrics -- from 146 million to 175 million meters.

The years 1977, 1979 and 1980 were extremely difficult for agriculture because of the unfavorable weather conditions. There were not enough fertilizers or insecticides either. The plans for the production of food crops were underfulfilled each year by approximately 1 million tons. Nonetheless, in 1980 14 million tons of them were harvested, which is almost 3 million tons more than in 1975.

The first 2 years of the 3rd Five-Year Plan were marked with new successes. In 1981 they harvested 15 million tons of food crops, and in 1982 -- 16 million tons. The average annual rates of increase in industrial production amounted to 12.7 percent in 1981-1982.

After the state reunification of the country, it was necessary to reorganize planning and management of the national economy. The system that took form

during the war period was unfavorable for effectively solving the problems of peacetime construction. Moreover, the retention of the old methods of management (maximum centralization of planning and administrative functions, material and financial resources, and curtailment of commodity and monetary relations) impeded the implementation of the economic policy of the party and the state. Actually, the economic reform began in Vietnam in 1976, even though the preparation for it -- the formation of organizational, legal and methodological foundations -- had been going on since the first half of the 1970's.

#### Paths of Reconstruction

These include, above all, further strengthening and improvement of centralized planning, along with expansion of local economic initiative; more active utilization of economic levers; the introduction of various forms of material incentives; and rearrangement of the organizational structure of the economic mechanism. The main accent has been placed on improvement of planning and management at the enterprise.

Since 1980-1981 a system of "three-unit plans" has been introduced here. It is oriented toward more extensive utilization of internal reserves. Thus it was permitted to expand production and the list of products produced with independent provision of raw and processed materials. This is not regulated by planning assignments and almost all of the profit remains at the disposal of the enterprise. Certain of them, the largest, have been given the right to enter the foreign market independently.

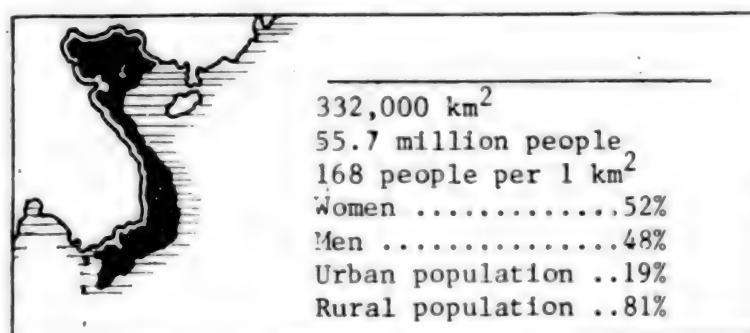


Figure. Territory and Population of Vietnam at End of 1981

A great deal of importance is attached to enlisting workers in the management of production and to the development of their activity. A special decree was adopted, which reinforces the rights and responsibilities of members of the labor collective in all spheres of the activity of the enterprise.

During the last years of the 2nd Five-Year Plan essential changes took place in the management of agriculture -- the main branch of the Vietnamese economy.

The new system of organization and payment for labor, which combines the brigade method and the contract, has strengthened the cooperative sector. In the cooperative, operations which require the application of machines or a good deal of manual labor (plowing, land reclamation and so forth) are performed by specialized brigades, and many others -- say, planting, tending the plants, gathering the harvest -- are performed by peasant families.

A plot of land is assigned to a family for several years. Based on the fertility of the soil and the number of able-bodied members, the family (or group of families) is given an assignment for producing and selling the state one crop or another (usually at the same level or somewhat higher than the average annual yield for the preceding period). The peasants may keep the products they raise in excess of the assignment.

The unified system for management of the national economy was formed in parallel with the socialist transformations of the multistructure economy of the south of the country. As a result of the expropriation of property by the comprador bourgeoisie, the national economy was augmented with more than 400 large industrial enterprises which comprised the nucleus of the state sector in this region. The enterprises of the national bourgeoisie were transformed into state-capitalist enterprises. By 1980 70 percent of the industrial output of the south was produced in state and combined enterprises.

The numerous handicraftsmen, artisans and small producers are gradually starting to cooperate with state assistance. By the end of the 2nd Five-Year Plan more than 50 percent of those employed in small and handicraft industry were drawn into various forms of collective labor.

The radical upsurge of productive forces of agriculture in the south and its limited inclusion in the system of statewide planning have become possible because of cooperation of the peasantry. In 1981 there were more than 9,000 agricultural production cooperatives in operation here. But the cooperation is not taking place uniformly throughout the territory of the country. This is explained both by objective differences in the conditions of agricultural work and by the social heterogeneity of the peasant masses. In 1981 in the central provinces of the SRV 82 percent of the peasant families and 76 percent of the cultivated area were joined into cooperatives. But in the provinces of the Mekong River delta, where before the liberation capitalist forms of business were widespread and the average peasant was the central figure in the countryside, these indicators were 10 and 7 percent, respectively.

#### An Important Landmark

The 5th Congress of the Communist Party of Vietnam was held in March 1982. It approved the basic directions and tasks of the country's social and economic development for the current five-year period and the 1980's. It was noted at the congress that, in spite of the successes in postwar restoration and development of the economy, there are still considerable difficulties. A serious critical analysis showed that the generally correct strategic line of the 4th Congress of the Communist Party of Vietnam (1976), which was directed toward constructing a new society in the country, had not been reinforced by a program which made it possible to solve essential economic problems. The

economic course was not coordinated with the concrete conditions of a country which had just been united after 30 years of war and destruction. It was noted that the subjective difficulties were brought about mainly by omissions in planning and management of the economy and the insufficiently rapid and effective reconstruction of all units of the economic mechanism.

At the 5th Congress of the Communist Party of Vietnam a decision was made regarding stage-by-stage reconstruction of the material and technical base of socialism in the republic. In the initial stage (up to 1990) the material and organizational prerequisites for industrialization should be created. The development of agriculture, increased output of consumer goods and export products and acceleration of scientific and technical progress take on primary significance during this period. Special emphasis was placed on the need to stabilize and gradually raise the standard of living of the population and, above all, find a radical solution to the food problem.

Before the end of the 1980's it is intended to complete a socialist transformation in the provinces of the south of Vietnam.

Table. Production of Main Kinds of Industrial Products

	1980	1981	1985
Electric energy, billions of kilowatt-hours	3.7	3.8	5.5-6
Coal, millions of tons	5.3	6.0	8-9
Cement, millions of tons	0.6	0.5	2
Mineral fertilizers, thousands of tons	313	273	350-400
Fabrics, millions of meters	175	158	380-400
Paper and cardboard, thousands of tons	47	42	90-100

The 5th Congress of the Communist Party of Vietnam pointed out the importance of forming an efficient agro-industrial structure for the national economy. During the current five-year period most of the funds are going to branches of industry that satisfy the needs of agriculture. A great deal of attention is being devoted to reconstructing and expanding existing production capacities and increasing the effectiveness of their utilization. At the same time construction is being continued on key industrial facilities, primarily in the fuel and energy branches.

In keeping with the control figures, in 1981-1985 the average annual rates of increase in national income will be 4.5-5 percent, agricultural production -- 6-7 percent, and industry -- 4-5 percent. It is assumed that the growth rates of the population will drop from 2.4 percent in 1981 to 1.7 percent in 1985.\*

\*NHAN DAN, 28 March 1982

## Soviet-Vietnamese Cooperation

"The USSR has been making and is making deliveries of necessary goods, materials and technical means for satisfying the needs of production and the life of the Vietnamese people, it renders assistance to the SRV in the construction of a number of facilities which are of great importance for creating the foundation for the material and technical base of socialism in our country ... The solidarity and all-around cooperation with the Soviet Union is a cornerstone of the foreign policy of our party and state,"\* it was emphasized in the accountability report of the central committee to the 5th Congress of the Communist Party of Vietnam.

Today Soviet-Vietnamese cooperation encompasses the majority of key branches of the national economy of Vietnam -- electric energy engineering, coal extraction, chemistry, machine building, geological prospecting, fishing, agriculture, the training of national personnel and so forth. By the end of the 2nd Five-Year Plan, with technical assistance from the USSR, about 200 national economic facilities were put into operation in the republic. At enterprises constructed with assistance from the country of the Soviets, they now produce 35 percent of the electric energy, 76 percent of the metal cutting machine tools, 89 percent of the coal, 90 percent of the sulfuric acid, and 100 percent of the superphosphate.

During the 3rd Five-Year Plan the Soviet Union is helping Vietnam in the construction of 40 more new projects. The largest of them is the Hoa Binh hydroelectric center on the Black River (capacity -- 2 million kilowatts), the (Falay) TES (640,000 kilowatts per year), the (Kaoshon) coal mine (2 million tons of coal a year) and the cement plant in (Bimshon) (1.2 million tons of cement a year). The first section of the cement plant in (Bimshon) was put into operation at the end of 1981. On the eve of 1983 the first section of one of the largest vertical mines in all of Southeast Asia, the (Mongzyong) with a capacity of 450,000 tons a year, was put into operation. With assistance from the USSR it is intended to construct a tractor plant, a plant for forge and press equipment, and a metallurgical combine. Special significance is attached to the continuing geological prospecting for petroleum and gas on the continental shelf of the south of the republic. In Vung Tau a joint Soviet-Vietnamese plant has been created for prospecting and operating petroleum and gas deposits.

The concentration of efforts on the construction of key facilities is already producing visible results. Thus the rates of work have increased at the superphosphate plant which is being created with assistance from the USSR in (Lamtkhao), the (Shongkoing) diesel engine plant, the construction of the (Tkhanglong) bridge across the Red River in Hanoi, and the coastal base for prospecting and operating petroleum and gas deposits on the continental shelf of the southern part of the country.

In January 1983 they dammed the channel of the Black River, which accounts for half of the hydraulic energy supplies of Vietnam. The GES constructed here, the largest in Southeast Asia, will make it possible to bring large

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\*VIETNAM COURIER, 1982, No 5, p 11.



deposits of minerals and forested areas into economic circulation, and also to regulate the flood waters during flooding, land reclamation and the assimilation of virgin land.

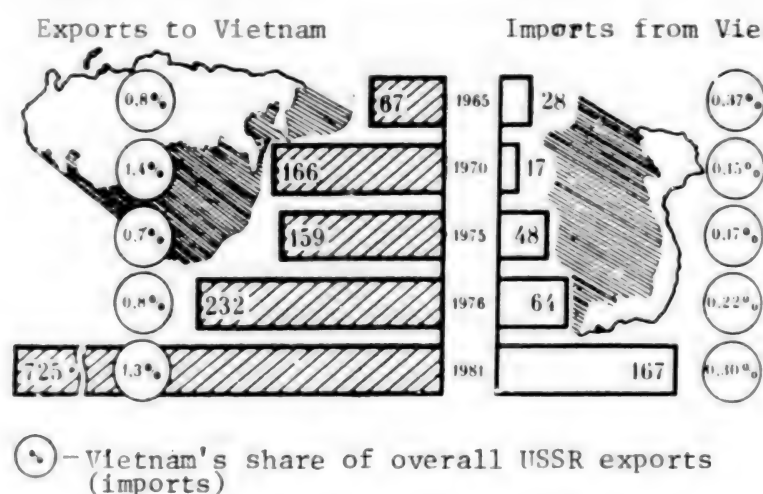


Figure. Soviet-Vietnamese Trade Turnover, Millions of Rubles

In 1981 important Soviet-Vietnamese documents were signed which gave a powerful impulse to the development of trade and economic cooperation between these countries: an agreement for Soviet enterprises to hire thousands of Vietnamese workers, a protocol concerning the results of the coordination of national economic plans of the USSR and the SRV for 1981-1985, and agreements for economic and technical cooperation and commodity turnover and payments for this period.

In 1981 the Soviet Union provided for more than half of Vietnam's foreign trade turnover. It includes items made of hardwood, bananas, fresh and canned vegetables and fruits, jute, tea, coffee, spices, sewn and knitted items and so forth. The USSR, in turn, delivers equipment, road and construction machines, trucks, rolled ferrous and nonferrous metals, petroleum products, chemical fertilizers, cotton and other commodities.

Because of Soviet technical assistance, in the future Vietnam could become a large exporter of rice, coffee, tea, fruits, vegetables, fish, natural rubber and commercial timber to the socialist market. At the same time conditions are being created for increasing the proportion of exports of products of mining (coal, tin, apatite) and light industry, and also handicraft products.

The ensurance of economic independence for the SRV in the sphere of the leading branches of industry is an important goal of the long-term program for the development of economic and scientific-technical cooperation between the USSR and the SRV, which was signed in Hanoi on 31 October 1983 by Comrades G. A. Alieyev and Pham Van Dong.

The long-term program is comprehensive in nature and encompasses all the main spheres of the economy. Of special interest is the consistent, planned development of the leading branches of industry. Thus regarding ferrous

metallurgy it is intended primarily to render assistance in the planning and construction of a metallurgical plant with a capacity of a half million tons of steel a year. According to the accepted international classification, this is a mini-plant with an incomplete metallurgical cycle, for which the raw material will be mainly scrap metal. During the long war years the American aggressors left millions of tons of metal on the long-suffering Vietnamese land. Now it will be used for peacetime construction.

At the same time work will be started to modernize existing metallurgical enterprises and to develop the technical and economic substantiation for a metallurgical combine with a capacity of 1.5 million tons of steel a year, with an orientation toward local resources of raw material that contains iron.

Table. Dynamics of Main Indicators of Development of National Economy of Vietnam

	1976 in % of 1975	1981 in % of 1976
Produced national income	115	106
Gross industrial output	113	104
Gross agricultural output	110	111
Cargo turnover of all kinds of trans- portation (excluding air)	130	104
Passenger turnover of all kinds of transportation (excluding air)	115	70
Retail commodity turnover, in prices of corresponding years	102	360
Foreign trade turnover, in prices of corresponding years	143	157
Including:		
Exports	156	127
Imports	139	166
Average annual number of workers and employees of state sector of the national economy	107	129
Capital investments in the national economy	132	98
Including:		
in industry	116	128
in construction	151	58
in agriculture and forestry	180	133
in housing, utilities and consumer services	108	72
in science, culture and art, public health, social security and physical education	179	57

The long-term program differs from the usual foreign economic agreement in that a special agency has been created to supervise its implementation -- the

Intergovernmental Soviet-Vietnamese Commission for Economic and Scientific-Technical Cooperation. As the need arises, this agency will develop and submit to the governments of both countries recommendations directed toward successful implementation of the long-term program.

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## SPECIAL WORKING CONDITIONS REQUIRED FOR MOUNTAIN TERRITORIES

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 156-164

[Article by V. Z. Dodin, candidate of technical sciences, Central Scientific Research and Planning-Experimental Institute of Organization, Mechanization and Technical Assistance for Construction of the USSR Gosstroy (Moscow): "Why It Is Advantageous for Firms to be Concerned About Workers in Remote Areas"]

[Text] By decisions of the party and the government, under the current five-year plan and in the more distant future there is to be extensive assimilation of the natural wealth of Siberia and the North. The severe climatic conditions, the distance and the difficulty of access of certain regions make it necessary to have special organization of production and different conditions for people's labor and rest. The USSR has experience in the development and successful application of new methods, particularly the expedition-watch method. There is also something of value in foreign practice -- and it could be utilized after the appropriate analysis.

Along with the regions of the North, data concerning the conditions for adaptation, labor, rest and nutrition of workers in the mountains of South America and Central Asia have been acquired and verified by science and many years of practice. This information could also apply to the assimilation of the mountain and high mountain territories of the USSR. The magazine has already published materials on this subject.\* The article offered for the readers' attention in this issue develops it.

When assimilating Arctic and high mountain regions, particularly when laying reserve lines of transcontinental pipelines in the northern regions of America and communications (roads, electric power transmission lines) in the Andes and

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\*See EKO, 1980, No 10.

the Cordilleras, when constructing enterprises and civil engineering structures in the Yukon mining and industrial region and in other mining basins in the north of Alaska and Canada, they extensively utilized the so-called pioneer mobile expedition-watch construction complexes (hereafter this phrase will be shortened to -- complexes). They are very flexible and, under certain conditions, can solve fairly complicated and urgent problems. When evaluating the effectiveness of the complexes the entrepreneurs had to take into account the high cost of all production factors and the amount of losses possibly resulting from interruptions caused by poorly thought-out plans and variants of their implementation, breakdowns of machines and mechanisms, and illness of personnel. Therefore the corporations consider it more advantageous to spend money on predicting and planning as early as the stage of signing contracts for construction work. A special role is played by personnel training.

Under expedition-watch conditions, the workers sometimes travel over great distances. As a result of the abrupt changes in climatic conditions and time zones, there is frequent occurrence of climate shock, and also disturbance of biological cycles of vital activity which have been the same for years. The consequences of this shock (not even counting subsequent temporary or permanent pathology) are presented in the table. Labor productivity drops sharply and illness increases during the first month of work.

Table. Effects of Moving Workers Without Preparation to Regions With Extreme Conditions

Transfer to climate zones with resettlement	Time zones from zonal time map			
	1	4	8	11
One Zone				
Distance, thousands of km	1.6	6.7	13.3	18.3
Labor productivity, % of standard	100	94	71	27
Disability time, hours	21	32	44	52
Adaptation time, hours	16	32	64	112
Two Zones				
Distance, thousands of km	2.4	6.9	13.4	18.4
Labor productivity, % of standard	100	97	84	68
Disability time, hours	23	37	56	68
Adaptation time, hours	28	68	156	276
Five Zones				
Distance, thousands of km	8.4	10.8	15.6	20.0
Labor productivity, % of standard	99	83	--	--
Disability time, hours	32	55	87	115
Adaptation time, hours	64	160	420	--

Specialists have conventionally determined the optimal type of worker for complexes operating in arctic and subarctic conditions. This is a man from 28



to 50 years of age who is suitable, according to standard tests, for service in the navy. He must be a family man and it is preferable if he has children.

Usually two types of people are selected as watch workers: either they are the melancholic "thick-skinned" type, always calm, imperturbable, level-headed people with slow, but steady reactions, or they are choleric -- easily excitable, "thin-skinned" people. According to the conclusions of specialists, 40 percent of all healthy people are of the first type. It has been established that under the conditions of a closed watch if the collective consists of workers of these two types, it is stable. A healthy psychological climate is formed from personalities that augment one another -- the creative incitability of the latter and the stabilizing influence of the former.

As a rule, the choleric are more talented, more educated and better trained for work, they orient themselves in a situation more rapidly, and they are the first to find the optimal solution. In the presence of melancholics they become more purposive and efficient. The latter, in turn, organize the work better and bring it up to the required level.

But along with their positive qualities, choleric also have negative qualities which are reflected, in the final analysis, in the results of the labor. Thus they withstand the changes in climate and season with difficulty. With time, however, their ability to work stabilizes, but, as a rule, their labor productivity does not ever reach the maximum of the melancholics. These patterns have been established and are taken into account when calculating the labor productivity of the watch subdivisions.

When hiring a choleric and selecting, training and creating conditions for adaptation and assignment in its mobile enterprises, the firm takes into account the nature of the spring stress of a worker of this type and in the event of injury that is not deliberate (provoked) in nature, the firm is obligated to pay him (and in the event of the death of the worker, his family) the lost earnings for the period established by law or determined by the court.

All this proves the urgent need to investigate all questions of labor supply for expedition-watch work -- the selection of people, their training, the creation of optimal conditions for labor and rest, conditions for transfer (including commuting), adaptation conditions, the legal basis of expedition-watch activity, and so forth.

Specialists explain the age range (28-50 years) of workers of the complex by two circumstances. First, by 28 personality development is completed, and the lagging parameters of mental development "catch up with" physical parameters which have been in the lead. By this time the worker is also developed as a professional: he has acquired enough experience and the necessary work skills, which guarantee high labor productivity, and the requirements of safety techniques are met automatically. By 28 years of age a man is usually married and, as a rule, has two children. This circumstance is valued more highly than others when a person is hired for the complex: such a person is usually firmly attached to the job and has a positive attitude toward suggestions to

intensify labor for the sake of additional earnings. This is also advantageous for the corporation, although the earnings of workers in the complexes are usually the highest in the given country.

Public health agencies and insurance companies refuse to give insurance for immature young men to be in arctic, subarctic and high mountain zones if they have not been born and grown up in these zones. Specialists have established irreversible genetic anomalies in fathers and their children, and the dynamics and degree of their pathological development are directly dependent on the time and peculiarities of commuter work on the part of the father. The maximum pathological changes (of the most serious genetic and even genetically irreversible nature) are found in male parents from 18 to 23 years of age. And the curve of serious consequences is extremely smooth, without any expressed tendency toward a significant reduction. It includes the next 3 years -- until 26, and only at the mark of "27 years" does it drop sharply, reaching the indicator of "28 years."

The peculiarities of the formation and operation of the complexes show the expediency of conducting construction and installation work during a particular season. According to data of many years of research and the results of an even longer period of practice, this season lasts 7 months -- from May through November inclusive.\* Thus members of the expedition remain in the region of the complex continuously for all this time. During this period organizational expenditures and the cost of construction and installation work are relatively low, expenditures on food and amenities are less, electric and other forms of energy and fuel are saved, and labor productivity increases significantly.

The traditional work schedule of the complexes is one shift (8 hours of work with a 40-hour work week). But in practice the work time of all construction and installation subdivisions increases to 12-15 hours a day, for the very idea of a watch presumes a maximum labor return (and with maximum compensation).

The contract envisions clearly specified amounts of several categories of overtime work, for which there is a work front and resources. The categories are established depending on the natural and climatic peculiarities of the work period (day, week and so forth). The maximum amount of overtime is allowed with favorable weather conditions (relatively stable barometric pressure, no blizzards, and air temperature above 45 degrees C) and the permission of the watch physician, which is registered in the watch journal and the watch card catalog. Thus the length of the overtime 4-week watch ranges from 80 to 86 hours (including 6 hours on Saturday).

Thus the so-called optimal load of workers of a 1-week watch amounts to about 68 working hours, 2-week -- 80-129, and 4-week -- 160-246 hours. The medical services and the managers of the complexes have given a positive evaluation to the working conditions of all three categories of watches.

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\*Excluding subtropical marshy regions where it is expedient to work during the winter.

The life of the workers at expedition bases is unique. The housing complexes are prefabricated trailer sections of the hotel type, which are distinguished by their comfort. They are also intended for housing family members, who fly in to visit the workers on assigned days of rest and holidays. The periodic visits of wives and children have a favorable effect on the psychological climate in the collective, and thus they increase labor productivity. Another favorable factor is that this way the workers do not make "shuttle" flights to the regions where they permanently live. This prevents disturbances and disruptions of the conditions for adaptation. Moreover, brief periodic (once or twice a season) visits of family members, according to data of the medical services of insurance companies, have practically no harmful effect on the health of the women and children.

For the 5 months the workers have off during the winter they return to their families in the regions of their permanent residences. Interested in retaining highly skilled and easily adaptable construction personnel, the firm compensates for expenditures with a special stipend, which is more than made up for by the advantage it receives.

The adaptation of people who are being prepared for work at watch projects is carried out at expedition bases during the second half of this same vacation period. This is fairly hard on the psyches and physical organisms of the new workers. The newcomers go through a 2-month training program here consisting of 11 courses -- "survival" and "life support" (with orientation, acquisition of food and fire, building of shelter, including those made of snow and ice, and so forth), "sports training" with walking and skiing marathons under the conditions of the icy wasteland, "sanitation training" with the rendering of self-assistance and assistance to a comrade under the conditions of the climatic extremes, "radio communications," "practical astronomy, including navigation (fundamentals)," and so forth.

After training and initial adaptation, the new workers are sent, as a rule, to the coastal arctic zone of the north ("alpine" groups are sent to the high mountain areas of their base regions). Here the builders go through a final 1-month course of special arctic or high mountain preparation and adaptation, they reinforce the knowledge they have acquired with practice, and when the watch season begins they are included in watch groups, and these must be at newly opened construction sites.

Psychologists assert that the 3-month graduated adaptation prepares a person well for the life and work under the conditions of natural and climatic extremes and enables him to work productively from his first day on the watch and painlessly become accustomed to the severe conditions, which, according to statements from medical groups of insurance companies, takes another 400-650 days of total residence in the work zone. Hence the insistent need to retain permanent expedition-watch commuter personnel who have undergone the lengthy adaptation and have achieved the optimal ability to work.

The fact that the newcomers are sent only to newly opened construction precludes the problem of "old timers" and "neophytes," and the psychological climate of the watch is normalized from the very beginning.

In lengthy experiments a system was developed for rest under the conditions of expeditions and watches. Active ways of passing time were encouraged: sports, representational and musical creativity, and so forth. In closed watches conditions are especially favorable for studying foreign languages. The students form language groups at work stations and in the trailer villages.

During 1953-1964 various systems of rest and nutrition were studied in the villages and at the work stations during the watch period. The research determined three effective systems which were distinguished by the quantity, duration and rhythm of the recesses, depending on the nature of the labor of the workers and the peculiarities of the utilization of the watch time. In the final analysis, the most advantageous was selected. It provides for eating six times a day, including receiving hot food four times a day during work.

Usually the complex performs work for installing and starting up elements of all types of objects, which are fully prefabricated at the manufacturing plants or at their own bases. A considerable proportion of the "prefabricated" module-block units, including the micromodules of plants and auxiliary facilities (except principally inseparable ones) are manufactured under orders from the management of the complex and weigh up to 80 kilograms, which makes it possible to carry out all transportation, loading and unloading, and installation work with only two semiskilled workers who use a manual microwinch, a pneumatic or electric screw driver and a scaling ladder. There is never a need to dispatch and maintain mechanisms, machines and so forth in autonomous points with a limited number of facilities under construction and with a relatively short period of work.

Taking into account the dispersion and the constant mobility of the complexes, the administration of these formations was about to increase the number of management superstructures (mobile construction administrations, administrative offices) in keeping with what would seem to be a self-suggested schema: "mainland" -- "outpost" -- intermediate base -- expedition base -- and, finally, watch site. But the shortcomings of this apparently reasonable schema immediately became clear: responsibility decreased, duplication appeared, and time periods for preparing for and conducting the work were prolonged inadmissibly. Finally they returned to direct communications between the watch and the base administrations.

These are some the principles of labor organization under extreme conditions which are applied abroad. They are conditioned to a considerable degree by the economic laws of the capitalist mode of production. Still, attention should be given to the scientific developments and practical experience which make it possible to achieve high labor productivity while protecting the physical and psychological health of the worker.

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## BOOK ON 20TH-CENTURY SIBERIAN LIFE CRITICIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 165-174

[Review by N. P. Orlov, doctor of economic sciences, professor, V. I. Botvinnikov, doctor of geographical science, professor, N. A. Pritvits, candidate of technical sciences, and A. A. Kin, candidate of economic sciences (Novosibirsk) of the book "Sibir': XX Vek" [Siberia: The 20th Century] by Adzhiyev, M., "Sibir': XX vek," Moscow, "Mysl'", 1983]

[Text] On the cover is a panoramic photograph as seen through a "fish eye." The industrial landscape of Siberia looks almost like a globe, emphasizing the global nature of the subject. The title is also very promising: "Siberia: The 20th Century."

Of course Siberians have opened the book with special interest. They have opened it, read it ... and yawned. Because it has been a long time since they have encountered such a concentration of unconscientiousness and sometimes even illiteracy, the more so in a book published by a respectable central publishing house. There is no doubt that the book brings together a lot of material gleaned from numerous sources. But judging from everything, it was selected with a fair amount of confusion and was arranged quite arbitrarily.

### Underestimation of Modern Events

In the words of the author, he wished to discuss the events which changed the entire life of Siberia in the 20th century. Unfortunately, in a number of cases the author devotes much more attention to the distant past, and he dismisses lightly those events that are closer to us in time.

Thus the construction of the Transsiberian Railroad at the end of the last century is described in detail and eloquently. The reader can learn about the particular role played in the construction of the railroad the governor general of Eastern Siberia, Count Murav'yev-Amursky, the finance minister S. Yu. Vitte and even the French engineer Loique de Lobel... And inexcusably little, offensively little is said about the Baykal-Amur Mainline -- one of the largest Siberian construction projects of the 20th century. The book contains not a single line about the shock Komsomol detachments, nor about the emissaries from the union republics, nor about the



"branches from the BAM" -- tunnels constructed under the most difficult conditions, nor about the program for economic assimilation of the BAM zone. It does not contain even the most general information about the plans of the railroad or about the scale of the construction.

The discussion of the assimilation of the North Sea route begins with the sea campaigns of the 16th century. At the center of attention is the passage of the ships Taymyr and Vaygach along the northern coasts of Asia in 1914-1915. The other sea trips that have entered the history books, of the ships Sibiryaki, Chelyuskin and Fedor Litke, are mentioned in passing.

And nothing is said (the three lines on page 225 do not count) about the new era in the assimilation of the northern seas -- the birth and development of the Soviet atomic ice-breaker fleet and its flagships -- Lenin, Sibir', Arktika and Rossiya, or about the legendary journey of the Arktika straight to the North Pole.

#### Outdated Data

Unfortunately, the author is not very familiar with recent research which has been conducted in scientific research organizations of Siberia. From the content of the book it is clear that he knows almost nothing about the materials of the All-Union Conference on the Development of Productive Forces of Siberia, which was held in 1980 in Novosibirsk. Here they generalized the results of a retrospective analysis of the economic development of Siberia, introduced precise information about the supplies of natural materials, characterized in a largely new way the crucial problems of the economic and social development of Siberia before the end of the current century, and discussed various scenarios of the future. In recent years the Institute of Economics and Organization of Industrial Production has conducted a number of scientific expeditions, during the course of which they accumulated information about the actual condition of the economy and generalized the results of preplanning research and planning developments. But the author is ignorant of these scientific stockpiles, although the majority of them have been published. As an information base he used ideas and data taken from publications of the 1960's and 1970's. And therefore his evaluations and factual data frequently do not correspond to the modern level of knowledge.

In the section entitled "And the North Wind Blows Toward You," relying on ideas that are 10-15 years old, the author describes the problems of organization of construction and repair on the basis of support construction bases that were brought into the southern regions of Siberia. But modern forms of construction and repair work are far from those former ideas. Outdated information is also used when describing methods of solving the transportation problem in the Western Siberian petroleum and gas complex. Thus the ice roads that are used even in the summer (p 133) never became widespread. The author mistakenly creates the impression that platforms on an air cushion are used so extensively that there appeared a "new kind of transportation" which makes it possible "in many cases" "to do completely without roads in the ordinary sense" (p 132). One should not present what is desired as reality.

"Vilyuysk gas delivered here (to the southern zone of the Far East -- ed.) through the pipeline can stimulate chemical production. Imported gas and local rock coal will create a basis for an energy complex. Chulman coke delivered on the BAM will make it possible to expand production at the Amustal' metallurgical plant in Komsomolsk-na-Amur" (p 31). But researchers and planners are not even talking about transporting Vilyuysk gas through the pipeline to the south of the Far East, while a gas line is already being constructed from Sakhalin to here. Amurstal' and the reduction metallurgical plant that is being constructed next to it have no blast furnace production and so they do not need coke.

One also senses that the author is behind the times in the chapter on Taymyr. Much is said about the history of Norilsk, about northern urban construction, but the reader does not learn either about the Talnakh deposit or about its deepest mines -- the Oktyabr'skiy and Taymyrskiy, or about the famous Nadezhda metallurgical plant -- the second section of the Norilsk mining and metallurgical combine.

### Superficial Judgments

Serious objections are aroused by the chapter entitled "Lessons of the Complex," where M. Adzhiyev has tried to discuss the creation of territorial production complexes in Siberia. In particular, the author writes: "The Bratsk - Ust-Ilim TPK produced a surprise: it showed that it is not necessary to form a territorial production complex" (p 158).

Yes, the "lessons of Bratsk" -- the shortcomings of the complex caused by departmental separation when forming a single city -- are well known. But the author, who calls himself a geographer-economist, should know (and tell the readers) the main thing: in the Bratsk - Ust-Ilim TPK the richest resources of the area were brought into economic circulation in a short period of time. Economic indicators show the high effectiveness of the industrial complexes that exist in it: thus the profitability of the production of the main branches of the TPK exceed the country's average figures for corresponding branches from 1.5 to 3-fold!

The experience in the development of the Bratsk - Ust-Ilim TPK was the subject of consideration of the International Institute of Applied System Analysis and rated fairly highly by specialists.

The book's main shortcoming is clear in this chapter: its superficiality and its shallow judgments. The fact that transportation between the rayons of Bratsk is poorly arranged means that there is no complex! The author worked for a season on a gold prospecting crew -- and now he has already reached the conclusion that the main organizational problem in the tactics of assimilating a new territory is to decide "artel or mine?" (p 115).

An exaggerated style prevails in the book: "all these immense outlays are nothing compared to the expected profit (p 134); "the first deep wells literally flung open... paleozoic deposits" (where there is oil) (p 130); "it will take only minor efforts to create in the ancient and present river valleys a single system of waterways of the future" (p 178) ...

Siberian crop growing looks quite idyllic in the book: "After spring plowing the grain is planted and there are no problems with it until harvesting. And in the autumn the combines pass over the fields ..." (p 180). And that is all there is to it!

The measures taken in Siberia for the protection of nature appear ridiculous in the book: "Siberians have already begun to protect nature with has inadvertently suffered. Trees and bushes have been planted at a number of industrial facilities. In the city parks ... trampled-down bald patches have been covered with sod and planted in grass" (p 166). Protection of Siberian nature is a crucial problem, and it is being solved on quite a different scale. Thus the amounts of recultivated land that have been returned to agriculture and forestry number in the tens of thousands of hectares.

The author presents in a confused way the problem of diverting some of the water from Siberian rivers to the south (pp 174-178). In his description he combines features of various plans as though they were the selected variant. He is also wrong in asserting that "in parallel with the construction of the main channel it is suggested that an auxiliary channel be constructed to join the Ob' and the Yenisey" -- such a variant has not been considered so far.

#### Confusion in Predictions

In a number of cases the author distorts the quite real prospects, which are conditioned by economic development, including those earmarked in state plans.

"In the energy policy of Siberia and our entire country by the year 2,000 petroleum and natural gas will lose their leading position ... and the role of coal will stabilize as the most reliable energy bearer" (p 153). Let us compare this statement with the recommendations of the 26th Party Congress: "It is necessary to reduce the proportion of petroleum as fuel, to replace it with gas and coal, and to develop atomic energy more rapidly" (Materials of the 26th CPSU Congress, Moscow, 1981, p 38). The difference is obvious. KATEK "by the beginning of the 21st century will be able to produce a billion tons of fuel" (p 6). This is several times greater than the most optimistic estimates.

"GeoTES in Western Siberia can also become large energy producing complexes" (p 142). They cannot. Western Siberia is not Kamchatka. The underground thermal waters here are suitable at best for heating, and having warmed hothouses, for therapeutic purposes, but not for obtaining electric energy.

The second large example of a distorted idea about the future has to do with the food base. "Today's Siberia -- the country's largest fuel and energy base -- should be transformed into the largest food base!" (p 11). The author's emotional outburst, however, is not supported by serious conclusions. These two kinds of bases cannot be placed on the same plane: now Siberia, which produces about half of the fuel, produces only 8 percent of the agricultural products in the union. And the regions potentials are not the same in the two areas: for considerably more than half of the region's territory is in the northern zones where the possibilities of increasing the production of agricultural products are limited.

The author also shows his ignorance when describing the development of agriculture in Southern Siberia. In his opinion, "... in Omsk and Novosibirsk oblasts ... agriculture will become suburban" (p 180). And this has not happened yet because "the population of the cities and workers' settlements is relatively small here." And this is written about oblasts that are known as important agricultural regions of Siberia, whose centers are large industrial cities with a population of more than a million each!

These statements can serve as evidence of the level of the author's understanding of problems of agriculture: "in the agricultural group of resources, one should regard sapropel deposits as the most important" (p 7); or "the utilization of the flood plains of the Ob' and Irtysh rivers is the main problem of modern agriculture" (p 183).

It is not only agriculture that gets it in the book.

"When the railroad comes to Tynda and Southern Yakutiya there will no longer be a need for expensive automotive shipments, and soon the drivers will be out of jobs. This will happen when they construct the BAM" (P 200). Alas, in order to eliminate the need for these shipments it would be necessary to build another railroad: Berkakit-Tommot-Yakutsk.

"Near Tyumen they intend to construct a chemical combine which will provide the neighboring oblasts with mineral fertilizers and synthetic fibers (p 140). There never has been such a plan.

#### Profanation of Scientific Concepts (Using the Example of Baykal)

Here is how the origin of Lake Baykal is described. "There was probably an extremely severe earthquake, as a result of which the earth dropped on a large territory and an immense depression was formed" (p 197). The notion that the Baykal depression was formed all at once is quite unscientific. The lowering of the strip of earth's crust and the formation of folds, depressions and a network of ruptures, also accompanied by earthquakes, took place gradually, during the course of millenia.

The idea about the accumulation of sedimentation in Baykal is also distorted. First, "processed food products" of fish, plants and micro-organisms are certainly not the only things that settle on the bottom. There are also (and mainly) solid substances that come from the intakes as a result of wind and water erosion of the slopes. And the growth of this layer, according to modern ideas, amounts to an average of 4 centimeters per thousand years, and not 1.5-2 meters, as M. Adzhiyev writes (p 196).

The chapter on Baykal discloses nothing at all about its significance as the reservoir for one-fifth of the fresh water on the planet, as a body of water with unique animal and vegetable worlds, and as a unique natural plant for purifying water and saturating it with oxygen.

The problem of preserving and utilizing the lake's natural resources is treated quite superficially: one might think that all the unpleasantness is in the past and that this problem has already been removed from the agenda. Yet



the condition of the lake continues to cause alarm, which was discussed at the session of the RSFSR Supreme Soviet in December 1982. It is no wonder that it is written in the decisions of the 26th Party Congress: "to continue work for protection and efficient utilization of unique natural complexes, and above all Baykal."

One can give many other examples of unscientific statements on the part of the author.

#### The Unceremonious Attitude Toward Sources

M. Adzhiyev has a strikingly unceremonious attitude toward the authors from whom he gleans information.

On the second page of his book he writes: "They say that Siberia was discovered in the 20th century. Is this true? There were three discoveries of the taiga land! People discovered it three times!" And he "forgets" to say that this publicistic idea has already been expressed repeatedly, including in the book by Academician A. P. Okladnikov, "Otkrytiye Sibiri" [The Discovery of Siberia], (Molodaya gvardiya, 1979), with which M. Adzhiyev is apparently quite familiar. It seems that this is precisely where he found the excerpts from the chronicles (in M. Adzhiyev -- p 3; in A. P. Okladnikov -- pp 6-7), from the article by A. Gastev (in M. Adzhiyev -- p 4; in A. P. Okladnikov -- p 212), and several paragraphs about Yermak and the cultural revolution in Siberia were taken directly from A. P. Okladnikov (p 3 and p 10; p 4 and p 221, respectively). Incidentally, M. Adzhiyev was not even especially careful about copying: he changed A. Gastev to A. Gostev, the ancient site of Ulalinka to Ulaninka, he distorted the description of the implements that were found, and concerning A. P. Okladnikov, he stated that he had discovered this site "while strolling in a city park"...

In the book one can find chunks of text (sometimes slightly changed) from the book by L. Shinkarev, "Sibir': otkuda ona poshla i kuda idet" [Siberia: Where it Came From and Where it is Going] (Izdatel'stvo "Sovetskaya Rossiya", Moscow, 1978) and from the survey of S. Bogatko "The Potential of Siberia," published in the newspaper PRAVDA on 11 February 1980.

The last chapter of the book is almost completely devoted to a conversation between the author and the chairman of the Siberian Branch of the USSR Academy of Sciences, Academician V. A. Koptug. "We talked for a long time," writes the author. And he goes on to paraphrase (sometimes entire paragraphs verbatim) the article by V. A. Koptug, "Problems of the Development of Science in Siberia," which was published in the magazine VOPROSY FILOSOFII (1981, No 8), from time to time inserting into the text appropriate (or not appropriate) questions.

But this is not enough for M. Adzhiyev -- while paraphrasing in the book the academician's article, he adds individual phrases to it, sometimes distorting the meaning of what has been written.

V. A. Koptug, for example, writes that the utilization of new geographical methods which are being developed by scientists for discovering petroleum



deposits "will make it possible to significantly reduce the volumes of exploratory drilling." M. Adzhiyev translates this as follows: "volumes of exploratory drilling are being reduced significantly." And he adds: "As we can see, the work of Siberian scientists, has made it possible to considerably reduce expenditures on searching for deposits." That is how simple it is. Scientists suggest introducing a new development, and for M. Adzhiyev everything is already done and it can be reported.

M. Adzhiyev is not even conscientious in dealing with Lenin's documents. He asserts incorrectly that in his speech of 6 December 1920 before the meeting of the Moscow aktiv RKP(b), V. I. Lenin "called for the construction of a new railroad for working the deposits." In this speech (PSS, Vol. 42, pp 55-83) there is not a word about such a thing. The draft of the decree of the SNK, "On Granting Concessions to the Great Northern Railroad," was adopted on 4 February 1919, and V. I. Lenin referred to this (PSS, Vol 38, p 13) when answering the notes of participants in the meeting of the Petrograd soviet of 12 March 1919. (They were speaking about the plan for the road which was to have joined the Ob' across Kotlas with Petrograd and Murmansk. The concession was never realized).

#### Factual Mistakes and Blunders

There is a great diversity of them.

"There was a time when Siberia provided meat for Russia and Europe" (p 11). There never was such a time!

"Siberia was the 'birthplace of wing metal'" (p 11). Wrong: the first aluminum plants were constructed in the European part of the USSR.

"In order to eliminate the postwar ruins more rapidly, the country began large-scale assimilation of the North" (pp 92-93). Everything is turned upside down here: during the first postwar five-year plan there were no financial resources for such assimilation; it had to be preceded by the completion of the restoration process, and the corresponding possibilities for the North did not appear until the middle of the 1950's.

The Angaro-Yenisey "TPK system originated ... during the difficult years of the great patriotic war" (p 11). Wrong: in the Angaro-Yenisey region they began to form TPK's after the war.

"... in the Transbaykal area there is an ore enriching combine that produces mineral fertilizers " (p 202). There is not. The Ozerninskiy combine is still in the process of being constructed.

Tobolsk is a "center for producing isoprene" (p 140). It is a pity, of course, but this product is not being manufactured there yet.

"Kamchatka ... provides all of the Far East with early fresh vegetables" (p 10). An obvious fabrication.

The Siberian steppes are the "main food basket of Russia" (p 179). How can it be the main one if it produces only about one-fourth of the harvest of grain crops in the RSFSR?

"The Ob' and the Yenisey are the largest rivers on the planet" (p 171). And what about the Amazon (it has more water than any other river in the world), and the Mississippi (it has more water than the Ob'), and the Nile (it is the longest river) and, finally, our Lena, which is longer and has more water than the Ob'?

Casinghead gas from petroleum extraction is a "... raw material which, unfortunately, is little used" (p 167). In fact about 70 percent of the gas is processed at gas processing plants.

The geologist L. Popugayeva, who discovered the kimberlite tube, was renamed Pugacheva by the author (p 101).

"In the East the BAM goes through the rich land of the Pacific Ocean Territorial Production Complex" (p 31). But there is no such TPK.

"If all of the bodies of fresh water in the Soviet Union were poured into new Siberian Sea (planned on the lower reaches of the Ob'), even this gigantic amount of water would still be inadequate. Five and a half thousand cubic kilometers -- this is what the volume of the new sea should be!" (p 174). Let us recall that the volume of water in Baykal alone is 23,000 cubic kilometers.

Sometimes the author gives the readers real geographic charades. On page 5: "Siberia reaches from the Urals to the Pacific Ocean!" But subsequently, on page 17, the construction of the Transsiberian Railroad is discussed as a "chain which joins the two oceans -- the Pacific and the Atlantic" ...

How Could This Happen?

All that has been said (and certainly not all has been said) leads to one conclusion: M. Adzhiyev and his publishing house "Mysl'" have been more of a hindrance than a help to Siberia by publishing a book which distorts the true picture of modern Siberia and gives an extremely confused idea of the prospects for its development.

How could this happen? It is a puzzling story, since one of the official reviewers of the book, N. M. Singur, an official of the USSR Gosplan, told us that he had recommended a good deal of additional work and also rewriting the manuscript to a considerable degree.

Two years ago the manuscript of another book by M. Adzhiyev ("Taygi raspakhnutyye dveri" [The Wide Open Doors of the Taiga]), which he submitted to the "Detskaya literatura" publishing house, was reviewed in Novosibirsk and rejected.

But this had no effect on its destiny -- it was published anyway in 1983. Most of it is a paraphrase of the preceding book, with entire pages repeated verbatim. True, the editors of the "Detskaya literatura" publishing house

approached the matter more responsibly, and the new book has many fewer mistakes, but many serious shortcomings remain: in certain cases he gives outdated or incorrect data, and in others -- unsubstantiated prognoses, which again give incorrect references to Lenin's work. Some new pearls have even appeared, for example, "the Siberian land ... is almost two of Europe" (p 5), and "the gigantic dirigible will carry ... a half million tons of cargo" (p 42).

The poor children -- such assertions could easily shake their faith in the printed word ...

In sports there is a system of disqualification when the sportsman, having committed a serious offense, is excluded from participation in competitions, trips and so forth. A good rule! We would recommend that M. Adzhiyev not be allowed to write such books. And also that others be taught not to do it.

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## QUESTIONS TO QUIZ ON LABOR OF SCIENTIFIC WORKERS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 175-176

### [Text] Questions

1. People with scholarly titles and degrees are included among scientific workers regardless of where they work -- in academic or branch scientific research institutes, the VUZ, libraries and so forth. At an enterprise can there be scientific workers who do not have these scholarly titles and degrees? How does one determine whether a specialist belongs to this category of worker?
2. In order to render assistance to workers of enterprises who are preparing to take entrance examinations for graduate school or a candidate's minimum, groups can be created with the enlistment of scientific and pedagogical workers to lead them. Which funds are used to pay for the labor of the latter?
3. A worker at an enterprise is given a vacation (leave from work) in order to complete a dissertation for the scholarly degree of candidate or doctor of sciences on the basis of a conclusion of the scientific and technical council of the ministry or department. In the former case this vacation amounts to 3 months, and in the latter -- 6 months. Who gives this conclusion if there is no scientific and technical council in the organization where the student works?
4. It is accepted to link the conferring of the degree of candidate or doctor of sciences to the defense of a dissertation. What other forms of scientific work can be submitted for defense?
5. The selection of scientific workers, and the appearance and curtailment of their labor legal relations with the organization are regulated by the overall norms of labor law, but with certain peculiarities. What are the most essential peculiarities?
6. What is the norm of working time established by law for scientific workers?

7. Taking into account the nature of scientific labor, individual categories of workers are given a specific work routine. What does it consist of?
8. The salary of a scientific worker depends on his length of scientific and pedagogical activity. Does this include the time worked at an industrial enterprise?
9. Scientific and scientific-technical workers and other specialists, according to the results of their certification, can be given increments to their wages. In what amount and under what conditions are they paid?
10. There are two forms of material incentives for scientific workers directly in production. What are these two forms?

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## CONVENIENT NOTEBOOKS FOR WEEK'S APPOINTMENTS DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 177-179

[Article by Kh. A. Bekov, candidate of economic sciences, Soyuzenergoremtrest of the USSR Ministry of Power and Electrification (Moscow): "A Table-Pocket Weekly Notebook"]

[Text] Having read the article by V. Layshko and V. Zorin, "Reform of the Notebook," in EKO No 7 for 1981, I decided to share my experience. I practiced their method of taking notes several years ago. It is indeed convenient, especially if one uses for fastening the pages a pressure cover cut from a thin sheet of nonrusting steel, nonferrous metal or plastic (Figure 1). The rigid cover supports the sheets and it is possible to take notes on them while holding the notebook in your hand. And situations in where there is no place to sit down arise fairly frequently. The note paper is approximately 80 X 120 millimeters and is for sale, and also it is not very difficult to cut it. Such a notebook can be carried in the inner pocket of a jacket or in a woman's purse.

But for more than a decade now I have been using another system for note taking, which seems even simpler and more convenient.

The pocket weekly calendar is made of a standard sheet of writing paper of format A4 (210X297 mm). The sheet is folded three times along the long (297mm) side. Then it is again folded three times along the 210 mm side. The resulting accordion calendar (figure 2) fits entirely in the vest pocket of a jacket, in which, as a rule, men carry nothing but a comb. The calendar is also convenient for women -- it can be carried in a purse, bag or pocket. When it is folded it is fairly rigid, which make it possible to write on it while holding it in the palm of the hand -- this is convenient at conferences, on transportation, in a telephone booth, while waiting in line, and so forth.

The calendar has six pages. Five of these are for Monday through Friday, and the sixth serves to record business for Saturday and for Sunday. On the upper part of each page one writes in bright ink the week and the day: "Mon. -- 5/9/83," "Tues. -- 6/9/83," and so forth. It is not necessary to mark off the hours: the whole day is divided into three parts by the bends in the paper, and this might be quite adequate for your business entries.

If there is a possibility of ordering the calendar from a printing office, it is expedient to have the days of the week printed -- Mon., Tues., Wed., and so forth, as well as the hours from 0800 to 2200. This way it is possible to enter dates of any week, even if it is several months in the future.

I use this weekly pocket calendar along with a regular year calendar, onto which I enter appointments that are more than a week away. On Saturday or Sunday, I transfer these to my pocket calendar. As a rule, notes that I make on the run (small bits of memory) also go on to the pocket calendar.

If we put together the 52 weekly calendars that have been printed by the printing office, we obtain a thin desk-pocket year calendar of standard sizes of 210 X 297 X 6 millimeters, which fits well into a business file, while the weekly calendars that are now widely used, with dimensions of 120 X 150 X 20 millimeters are too large for the pocket and inconvenient for a file. For business people, who use files or flat "attache cases," more frequently than thick brief cases, the sizes of the documents are of great significance. They should be as thin as possible, and the other dimensions should be standard, for files and cases are designed for standard papers. So there is empty space around a fat, nonstandard weekly calendar ...

The Voskhod firm gave a lively response to the suggestion of producing such desk-pocket calendars, and the designers of the firm's artistic design bureau suggested a number of additions, taking production technology into account. The following variant of the weekly calendar appeared (figure 3). In order that the next week's sheet can easily be torn off, instead of being stitched, the pages are perforated or glued in a special way. The lower cover of the weekly calendar can be made of a thick plastic or cardboard, and the upper -- of cardboard or a transparent soft film. The thickness of the weekly calendar, taking into account 10 pages for addresses, telephone numbers and other notes, will be 6-7 millimeters.

The owner of such a booklet can make notes for any time in the future until the end of the year. When a new week begins, a sheet is torn off from the booklet and the accordion is folded as is shown in figure 2. This piece of the calendar is carried in the pocket until the end of the week -- this is certainly what is done when there is no possibility of having the entire calendar on one's person; it can be carried conveniently in a brief case or be kept on the desk. And, I repeat, these situations occur frequently.

People might say that there is frequently a need to look at old entries. Well, the used sheets can be stored in a desk drawer, which always has one section which is a catch-all, and room will be found there for this compact archive.

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## ADVANTAGE OF DIRECT BUSINESS CONTACTS NOTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 p 180

[Article by L. V. Krivolutskaya, head designer, and M. Ya. Salyakhetdinov, senior engineer-designer of the Voskhod NPO (Moscow): "Mutual Advantage of Direct Contacts"]

[Text] The Voskhod firm is interested in materials published in EKO concerning experience in the utilization of office equipment. For a considerable proportion of our products (notebooks, note pads, calendars, address files and so forth) are intended for business people. It would be tempting in the future to present information about our innovations for the judgement of EKO readers.

Voskhod has a tradition of regularly updating the assortment of products it produces. We are assisted in this work by many organizations and individual enthusiasts -- scientists and administrators. A weekly calendar with average dimensions (150 X 110 X 20 mm) which is augmented with interesting materials for businessmen and engineers is now in the stage of completion of development. The suggestion for its production was made several years ago by Kh. A. Bekov, and we developed it in conjunction with scientists of the Moscow Institute of Management imeni S. Ordzhonikidze. This year Kh. A. Bekov gave us an idea for a new weekly calendar -- which was discussed above.

We have considered and added to his suggestion. We manufactured the experimental model which you just read about. We hope that the market will be large enough and that the readers will help us expand it.

In all probability, in 1983 we will produce an experimental batch for a practical check of the merits and shortcomings of the calendar. Depending on the responses from the readers, we will judge the volume of its subsequent output and, of course, we shall perfect it.

It is apparently always difficult to introduce innovations. This process is made difficult for us because we have a very large number of administrative levels and it takes long periods of time to coordinate and approve models of new items and their prices (this is why we have not yet produced Bekhov's weekly calendar!). Today there are 13 of these administrative levels, and the

approval of an item takes many months or even years. Certain items are obsolete before they appear in the stores. One wishes to believe that business contacts between the firm and the administrators directed toward improving the quality of our products will be mutually beneficial.

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## ANSWERS TO QUIZ ON LABOR OF SCIENTIFIC WORKERS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 181-182

### [Text] Answers

1. Included among scientific workers are specialists who do not have a scholarly title or degree, but who regularly conduct scientific work at enterprises in keeping with an approved subject plan for scientific work.
2. The labor of scientific and pedagogical workers who are enlisted for preparing specialists to take examinations for graduate school and candidates' examinations are paid with funds allotted by the enterprise for training and increasing qualifications of its personnel, or also with funds from the students on the basis of self-repayment.
3. If the organization does not have a scientific and technical council, the party who needs the creative leave can go to the scientific council of the VUZ or scientific research institute for his profile, whose conclusion regarding the scientific level and timeliness of the research will also be the substantiation for granting the creative leave from the place of employment.
4. Published monographs and scientific papers can be used in the defense. The basis of the dissertation, including when it is in the form of a scientific paper, can also be discoveries and inventions which have great national economic significance and works on the creation of new machines and instruments, structures and technological processes, if they meet the requirements placed on dissertation.
5. The essential features of the appearance, change and curtailment of labor relations of workers in the sphere of science are the following: 1) hiring by competition; 2) periodic election by competition; 3) longer probation time than ordinary jobs; 3) periodic certification.
6. The work time of workers of scientific research institutions is 41 hours a week, and the professor and teaching staff of VUZes -- 36 hours.
7. Leading scientific workers can be relieved of the requirement of signing in and out from work.



8. The work time of specialists who have a scholarly degree and are employed in their specialty at industrial enterprises is included in their scientific and pedagogical tenure.

9. Increments to wages are established in the amount of up to 30 percent of the salary within the limits of the planned wage fund, for which up to 2 percent of the fund is used (not including wages for workers).

10. Forms of incentives for scientific workers in production itself: 1) payment of increments for a scholarly degree and 2) equalization of the amounts of salaries for people who are working in production and have a scholarly degree with the salaries of the corresponding categories of workers of scientific research institutions.

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#### CONFERENCES OF ~~EN~~ READERS HELD IN KRASNOYARSK, KUYBYSHEV

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 183-185

Krasnoyarsk. About 200 of our readers came to the kray scientific library imeni V. I. Lenin. They were representatives of enterprises, scientific organizations and VUZes of the city. Interest in the magazine is growing in Krasnoyarsk: during the past 2 years the number of individual subscribers has increased by 300. The magazine was taken out from the kray scientific library 1,800 times during the year.

On the whole, those who spoke at the conference gave a positive evaluation to the main articles, expressed the hope that the magazine would not lose its timeliness, pointedness, polemical nature and the good language of the articles. Many liked EKO's format.

The manager of the Krasnoyarsksel'elektrostroy trust, A. P. Morozov, noted that the magazine's attention is directed more toward the economics than the organization of production. Clearly there have not been enough articles on problems of the brigade contract. In particular, it would not be a bad idea to have economic reporting on the work of a collective which has successfully incorporated brigade organization of labor.

In the opinion of the specialist in economics and information in nonferrous metallurgy, Yu. P. Sosin, the main problem which should determine the magazine's subject matter is increasing the effectiveness of production. Yet in EKO there have been practically no materials on increasing the effectiveness of territorial management (oblasts and krays), and questions of scientific and technical progress are not elucidated sufficiently. He would like for the magazine to devote special attention to such a reserve for increasing the effectiveness of production as efficient utilization of working time.

"A number of large enterprises of unionwide significance are being created in Krasnoyarsk, for example, the Krastyazhmash association, a machine building giant. It has been under construction for more than a year, but not a single line about it has appeared in EKO," said the manager of the group for scientific organization of labor and administration of this plant, V. P. Dranichnikov.

The head engineer of the branch of the special design bureau for computer equipment of the Siberian Branch of the USSR Academy of Sciences, D. I. Dreytser, the chief of the division for preparation of planning of the Krasnoyarskgrazhdanproyekt Institute, G. Ya. Krutyanskiy, Candidate of Historical Sciences from the Siberian Technological Institute, G. M. Makiyevskiy and other readers suggested more concretely that we write about theoretical aspects of production intensification and devote more attention to problems of planning and social problems of production organization.

A report on problems of the development of Siberia was presented at the readers' conference by the editor-in-chief of EKO, Academician A. G. Aganbegyan. A member of the editorial board and candidate of economic sciences, V. D. Rechin, announced the work plans of the editorial staff.

Participants in the conference decided to create an EKO club, and V. P. Abovskiy, director of the Krasnoyarsk PromstroyNIIProyekt Institute, was elected chairman.

V. N. Bogomolova, our correspondent

Kuybyshev. More than 100 readers gathered in the conference hall of the Kuybyshev Planning Institute to meet with the deputy editor-in-chief of EKO, Doctor of Economic Sciences B. P. Orlov.

In their statements the Kuybyshev subscribers and readers of the magazine discussed what EKO gives them and what they would like to see on its pages.

N. N. Osmankin, a docent of the planning institute: "We value the fact that the magazine is trying to break down the barriers of 'shop' limitations of specialists. There should be more frequent notification of decisions whose implementation is taking an excessive amount of time. It is also necessary to recall the responsibility of scientists who are drawn to new ideas without noticing that practical workers have not yet mastered the old ones."

V. M. Ryabtsev, head of the department of statistics of the planning institute, doctor of economic sciences: "The magazine forfeits something because of its desire to embrace the largest possible spectrum of problems. In addition to the columns 'Experience of Leading Enterprises,' 'Economics and Scientific and Technical Progress' and 'The Floor -- to the Director' which, in my opinion, are distinguished by their convincingness, there are many columns which contain material that is not very profound. Less attention is paid, for example, to questions of regional economics, concrete sociology, economic-strategic analysis, and the application of economic and mathematical methods."

N. A. Lapteva, senior instructor of the branch of IPK of management workers of the automotive industry: "In 1980-1982 the magazine paid less attention to business games. And yet many new ones appeared during this period. There are also other active methods of training and providing information which I should like to see in the magazine. A large problem which needs elucidation is that of wages for engineering and technical personnel."

Yu. G. Gel'tser, chief of the planning division of the Kuybyshevneftepromstroy trust: "We production workers need a magazine which stands at the juncture of science and production, so the EKO program meets our requirements. But the magazine could proceed further with regard to many issues. Thus the amount of time for considering the five-year plan is now very small. It would be possible to begin discussing it 2-3 or even 5 years before the beginning of the new five-year plan and conduct the necessary experiments and discussions. Among the problems pertaining to the enterprises I should like to note this one. A persistent battle should be waged to make sure that the economic services of the enterprises occupy a leading position."

V. A. Vaysburd, docent of the department of economics of labor of the planning institute, candidate of economic sciences: "Articles devoted to the stimulation of advanced experience and the practice of applying wage normatives per ruble of output are poorly represented in the magazine. They should think about introducing a special column for students of economic and engineering VUZes and young specialists."

Other readers who spoke at the conference also touched upon important issues which need to be elucidated, such as a systematic approach to advanced practice, the organization of competition at enterprises, methodological support for computer centers and so forth.

The editorial staff is grateful to all readers who participated in the conferences in 1983. Constructive criticism, serious analysis of what had been read, suggestions for improving the quality of the issues which are published, in brief -- everything that is heard at these meetings adds strength for continuing our work.

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## HOROSCOPE PRESENTED FOR MANAGEMENT PERSONNEL

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 1, Jan 84 pp 186-190

[Article by Leonid Treyer: "A Horoscope for the Manager"]

[Text] In place of instructions. As the EKO mail shows, many of our readers want to know: a) What are they really like? b) What awaits them in 1984?

For us the readers' wishes are the law!

Meeting them halfway, we are offering a completely new horoscope which contains a mass of valuable information. It will be appreciated by everyone who has a sense of humor. Otherwise this horoscope is counterindicated.

Dosage. Take in small doses after dinner or before bed.

Side effects. Indignation and offense sometimes occur during reading. In this case one should stop reading the horoscope.

Capricorn

Birth date:

22 December - 20 January

Capricorn is physically and morally strong. He has an ambitious spirit, but nobody would guess it. He sets his goal in childhood and proceeds toward it into advanced old age. He cannot get off the path, even if he wishes to. He practically never takes a risk, but is capable of making stupid mistakes. Sometimes in a moment of greatest tension he forgets where he is and why. His external rudeness conceals a good heart. He does not become close friends with his subordinates and suffers silently because of this. The management values him, but is still in no hurry to promote him. Money is not important to him, although he earns a lot of it. By age 55 he will have become a head engineer or the chief of a trust. The peak of his ability to work comes at the end of the month. Capricorn works best with Taurus and Scorpio as deputies. The best secretary for him is a Virgo. If a Capricorn marries, it is usually in the second half of his life. He is happy in marriage, but recalls his bachelor life with satisfaction.



Prediction for 1984. The year is dangerous for you. You will fulfill the plan by 101.3 percent. The management will be satisfied with you if you do not count minor unpleasantness, against which nobody is protected. A great love is not out of the question, but you must keep yourself in hand: feelings interfere with work.

## Aquarius

21 January - 18 February

Aquarius is both indecisive and impulsive. He can go for months without undertaking anything, experiencing all the while the fact that it is necessary to have earnings. But when a period of passivity is replaced by a period of activity, Aquarius takes on everything, sparing neither himself nor his subordinates. He frequently experiences dissatisfaction with his position, but he hides this, pretending to be in an excellent mood. Sometimes it seems to him that he could be fired any minute, and at precisely that moment he is promoted with a retention of salary. Aquarius never asks for anything, but still he has everything. People born under this sign are frequently the source of conflicts, but they are loved in the collective because of their good spirits. Aquarius is glad to take on social tasks during work time. He can find an unexpected solution to a problem, present an original idea, but he needs coworkers who will help divide up the success. Aquarius works best with subordinates who are Aries, under the condition that the strong character of Aries does not suppress the individuality of Aquarius.

Prediction for 1984. The year will be busy and interesting. In the first quarter there might be a reprimand, and in the last quarter -- a large bonus. Somebody will dig a hole for you, but you will fall into it yourself. Do not lose yourself in speculation. Try to spend more time in the fresh air.

## Pisces

19 February - 22 March

People born under this sign are dreamers, and they have a rich imagination which frequently lets them down. They frequently remain in the shadows unless they are pushed by a friendly hand. A career does not attract a Pisces, but for the sake of expanding their horizons they are willing to climb the job ladder. By nature they are compliant and inclined to go where the wind blows them. Therefore it is very important for the wind to blow them in the right direction. Frequently a Pisces works in an area which has nothing to do with his capabilities. And the stronger his aversion to his work, the more interesting his hobby. A Pisces has nothing against changing his job, but where he wants to go they will not take him, and where they will take him is even worse than where he is. He is always upset before trips, but he loves business trips and returns late from them. Most frequently a Pisces is not self-centered, but sometimes he is embarrassed about his selflessness and asks for a raise. They prefer emotional conclusions to logical ones, it is not difficult to move them to pity, but it is even easier to intimidate them. In spite of their indecisiveness, they are capable of unpredictable actions with unpredictable consequences (from large discoveries to the bench of the

convict). A situation in which a Pisces is in charge of a Pisces is extremely undesirable.

Prediction for 1984. Some success awaits you. It would be useful to take a vacation in the middle of the year. Financial difficulties are possible at the end of the year. Stay calm and dignified. Success will come in work. If you have said "a," say "b" as well!

## Aries

23 March - 20 April

People born under this sign are so full of energy that they prefer acting to thinking. Most frequently they have no talent at all except for one -- the talent for management. In spite of their sober frame of mind, they have a tendency for exaggeration. They are subject to falling from their boundless optimism (when they take on increased commitments) to persistent pessimism (when they are given severe reprimands). They are distinguished by aggressiveness, which is mitigated by their desire for justice, which frequently verges on being a mania. They try not to cause harm to things around them, but they are sometimes harsh with their subordinates. In spite of their apparently healthy appearance, they have a weak nervous system. They frequently lock themselves in their office and cry. They frequently fall into difficult situations because of their intolerance, and it is difficult to emerge from them with honor. If they are not held back by their lack of flexibility they can reach high posts which they are extremely unwilling to leave. They are capable of achieving success in practically any branch, provided that their deputies are Geminis or Sagittarius who are distinguished by their calmness and philosophical turn of mind. In family life they are hampered by their zealousness and explosive nature, but if the marriage does not break up in the first 25 years, it can turn out successful.

Prediction for 1984. You will achieve great success if you do not make a great mistake. You must be cautious. It is not impossible that the supplier will interrupt the supplies. Money will come into your hands of its own accord, but your expenditures will exceed your income. In moments of anger, look in the mirror. Avoid banquets in April.

## Taurus

21 April - 21 May

Taurus has been given common sense and practicality by nature, but he is impeded by laziness and a love of comfort. This is a complicated and contradictory nature. He is the first to introduce progressive methods and the first to lose interest in them. For a Taurus the form is much more important than the content, although he tries to tell everyone the opposite. Having healthy instincts, he finds joy and advantage even in failures. He is loved by both subordinates and superiors. He easily makes necessary acquaintances, sparing neither money nor time on them. Taking advantage of extensive ties, if a Taurus fails at his previous job, he will find a new one which is to his advantage. He is a skillful orator and his speech is filled

with jokes, which help him to shy away from crucial problems. When a Taurus does not understand what is required of him "from above" he usually goes on vacation or enters the hospital. People born under this sign are irreplaceable on festivities commissions, organizing committees -- everywhere where spectacle and effectiveness are required. When carried away by nature, a Taurus can inadvertently break the law. For this reason he is not suitable for positions that involve material responsibility.

Prediction for 1984. There will be a lot of work. No great unpleasantness is expected. You can expect successful implementation of earmarked plans under the condition that you have self-discipline. You will have three business trips, one of which will be useful. Anonymous letters will be written against you, but the fact will not be confirmed. If you are not married, it is best to get married.

Gemini

22 May - 21 June

Because of their lively mind, Geminis grasp everything on the run, without managing to clarify the opinion of the management, and then they frequently make a fool of themselves. They have well developed intuition, which guides them in confusing situations and leads to mistakes in simple ones. They are always trying to find out what others think of them, and once they have found out they do not believe it. The excessive impressionability of Geminis is the source of their irritation and lack of confidence in themselves, and therefore they must have a cautious attitude. Innate intelligence is combined in them with outburst of rudeness, which is expressed in markedly polite sentences. They are not unforgiving, and quickly forget offenses from friends and colleagues. They absolutely cannot remain by themselves they spend a large part of their working time in the corridors or in other people's offices. Geminis attach a great deal of importance to their external appearance, although there is something strange about their clothing. They give the world the largest number of geniuses and failures, although the former do not consider themselves geniuses and the latter have no doubt that they are. Since Geminis are excessively stubborn and suspicious, it is best to appoint them to prestigious positions which involve no real management of people.

Prediction for 1984. You must be active in the second half of the year, but do not be pushy. In the spring you will be offered work which actually turns out to be uninteresting, but the money is good. Defend your own interests. You should be afraid of colds and a reduction of the staff. If you smoke, it is best to stop.

Conclusion in next issue.

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